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Direzione Conservazione della Natura

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"ALESSANDRO GHIGI"

Walter Rossi

Italian Orchids

plates by
Anne Eldredge Maury

Quaderni di Conservazione della Natura

This publication series, specifically focused on conservation problems of Italian wildlife, is the result of a co-operation between te Nature Conservation Service of the Italian Ministry of Envivornment and the National Wildlife Institute "A. Ghigi". Aim of the series is to promote a wide circulation of the strategies for the wildlife preservation and management worked up by the Ministry of Environment with the scientific and technical support of the National Wildlife Institute.

The issues covered by the series range from general aspects, based on a multidisciplinary and holistic approach, to managementt and conservation problems at specific level.

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Preface

The classification of orchids has never been very stable, and even in the past the publication of a new work often changed, sometimes profoundly, the taxonomy in use at that time. In recent years ever more sophisticated techniques, especially the use of molecular markers, have accelerated this phenomenon and whoever approaches this fascinating family of plants can be bewildered by the almost continual nomenclatural changes.

For this reason I have, up to now, resisted various requests to write a book on the Italian orchids in the hope that studies in progress, including my own, would stabilize the classification: something I do not expect to happen in the near future. However, I found it impossible to refuse the proposal by the Ministry of Environment, via the Italian Botanical Society, to write a text to accompany the splendid plates of Mrs. Maury. This book should be considered not as a critical revision of what has been written to date on Italian orchids, but as an accompaniment to a pre-existing collection of illustrations. However, I have taken the opportunity presented to express my own opinions on certain controversial cases and to include some previously unpublished data.

This work would not have been possible without the collaboration of numerous colleagues and friends from whom I received comments, information and encouragement. I thank them all without quoting the long list of their names. A special mention however goes to Paolo Grünanger whose collaboration has been an essential contribution to this volume. He has published an important work on the Italian orchids to which one should refer for the most recently described taxa and for an exhaustive bibliography (Grünanger 2001).

Finally, to my late wife Graziella, who recently and unexpectedly passed away, I dedicate this book with affection and gratitude.

Walter Rossi

All the plants without a scale are reproducted natural size.

ORCHIDACEAE Jussieu

The orchid family is one of the largest among the flowering plants and includes some 20,000 species grouped in about 800 genera (Dressler, 1993). Orchids are found on every continent except Antarctica but they are most abundant in the tropical regions. There are over 100 species present in Italy but this figure varies greatly according to the criteria adopted for classification.

Orchid flowers are made up of six parts, three of which cover the other three when the flower is in bud. Although the flower is not differentiated into a calyx and a corolla, the three external parts are commonly called "sepals" and the three internal "petals" because they are often quite different from each other. In turn, the median petal differs greatly from the lateral ones and is called the "lip": it is almost always the showiest part of the flower.

The male and female reproductive organs of orchids are united in a single structure called the "gynostemium" or "column". All Italian species have only one fertile stamen with the sole exception of *Cypripedium calceolus* which has two. The pollen is not powdery, as it is in most other flowering plants, but the numerous granules are stuck together in small masses (usually 2, sometimes 4 in Italian orchids). These masses are often furnished with a small adhesive disc, the "viscidium", to which they are sometimes attached by a filament, the "caudicle". The whole structure including the pollen masses, caudicle and viscidium is called the "pollinium". In some cases the viscidia are protected by a thin membrane called the "bursicle". *Cypripedium calceolus* is also the exception to this case, since its sticky pollen does not have a well defined shape.

The ovary is always situated below the sepals and petals. Its form varies from nearly cylindrical (as in *Cephalanthera*), to swollen and pear shaped (as in certain *Epipactis* species). The ovary is sometimes attached to the stem by means of a pedicel which is generally short.

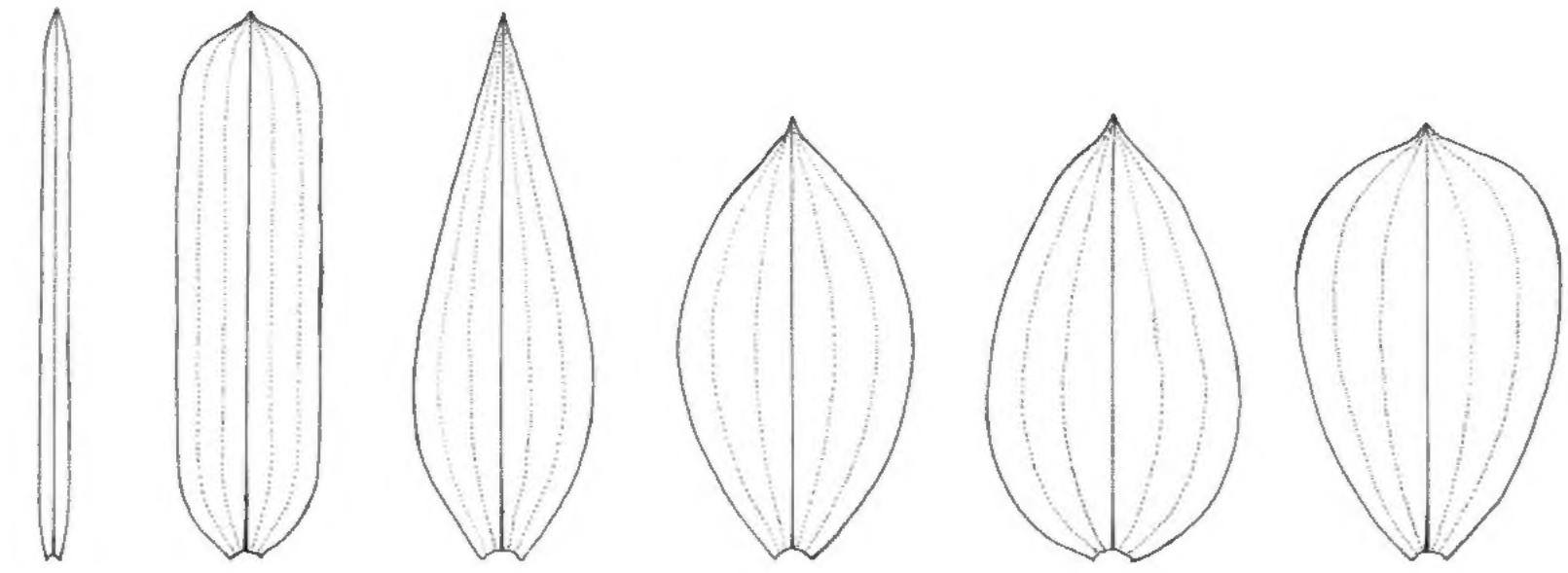
The fruit of orchids is called the "capsule"; it is a dry fruit when mature, which opens along longitudinal lines, usually six in Italian species.

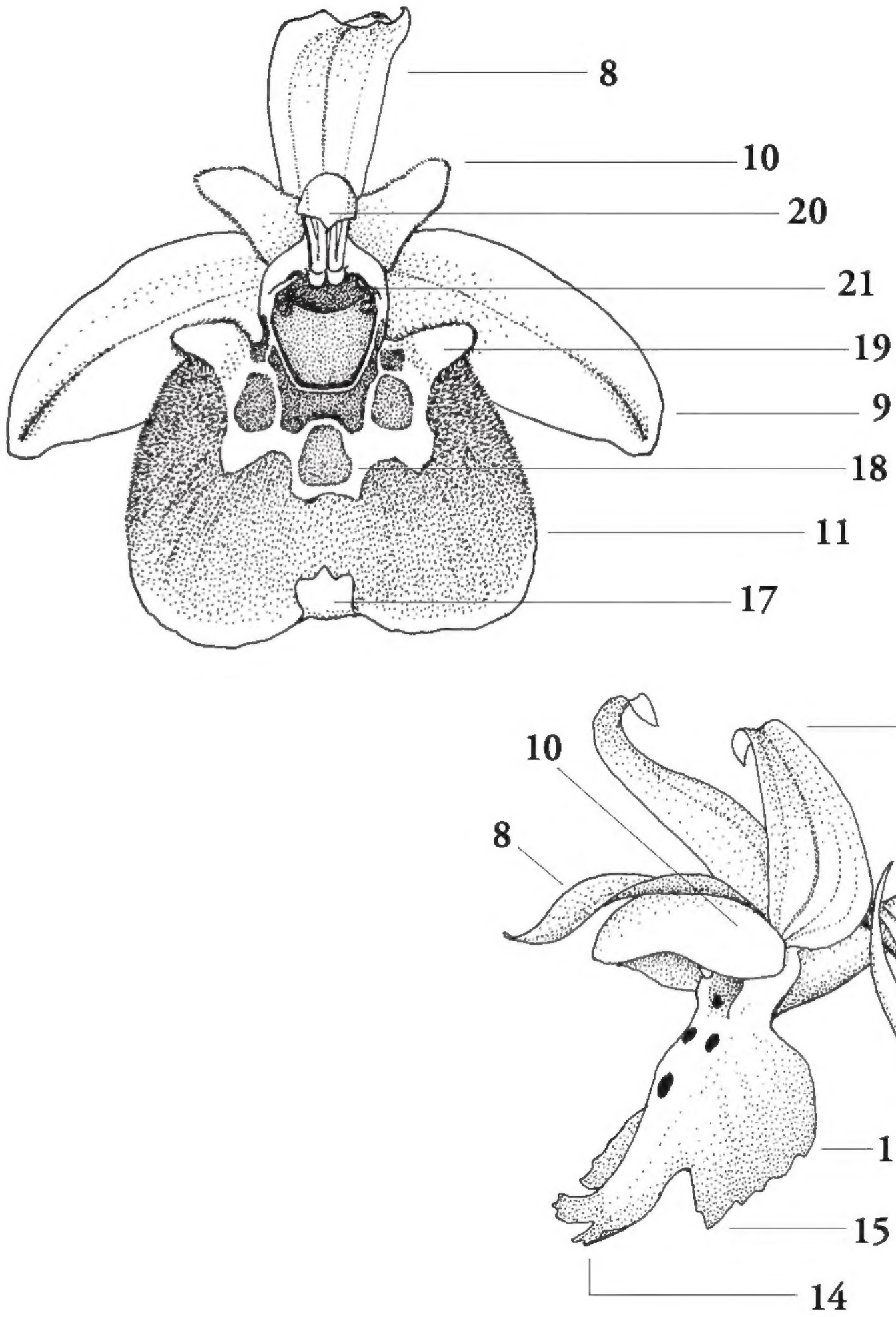
Orchids roots are relatively short and thick compared to those of many other plants. In many of the Italian species certain roots, usually two, are greatly enlarged and are called "root-tubers" or more commonly, although incorrectly, "tubers". These can be entire (as in *Ophrys* or *Serapias*) or more or less deeply divided (as in *Dactylorhiza*). In some genera (*Cypripedium*, *Epipactis*, *Cephalanthera*, *Listera*) the roots are all similar to each other and grow from an underground portion of the stem called the "rhizome".

Notes on the biology of orchids

Orchid seeds are extremely small and a mature capsule can contain several thousands of them. Because of their lightness they are easily carried for great distances by the wind. These seeds, almost totally lacking in food reserves, succeed in germinating only with the help of a soil fungus, which contributes the organic substances necessary for their growth. With the development of its first leaves the orchid will finally be capable of producing some organic substances through photosynthesis. Part of these substances is then passed on to the fungus, thus establishing a relationship which is advantageous both to the orchid and the fungus. An association which is advantageous to all the organisms involved is defined "mutualistic symbiosis" or simply "symbiosis". The

1 inflorescence
2 bract
3 stem
4 root tubers
5 shape of leaves
  a linear
  b oblong
  c lanceolate
  d elliptic
  e ovate
  f obovate
6 stalk or pedicel
7 ovary
8 dorsal or median sepal
9 lateral sepal
10 petal
11 lip
12 hypochile
13 epichile
14 mid-lobe
15 side lobe
16 spur
17 apical appendage
18 speculum
19 basal protuberance
20 column or or gynostemium
21 stigma
22 rostellum
23 pollinium
24 pollen mass
25 caudicle
26 viscidium

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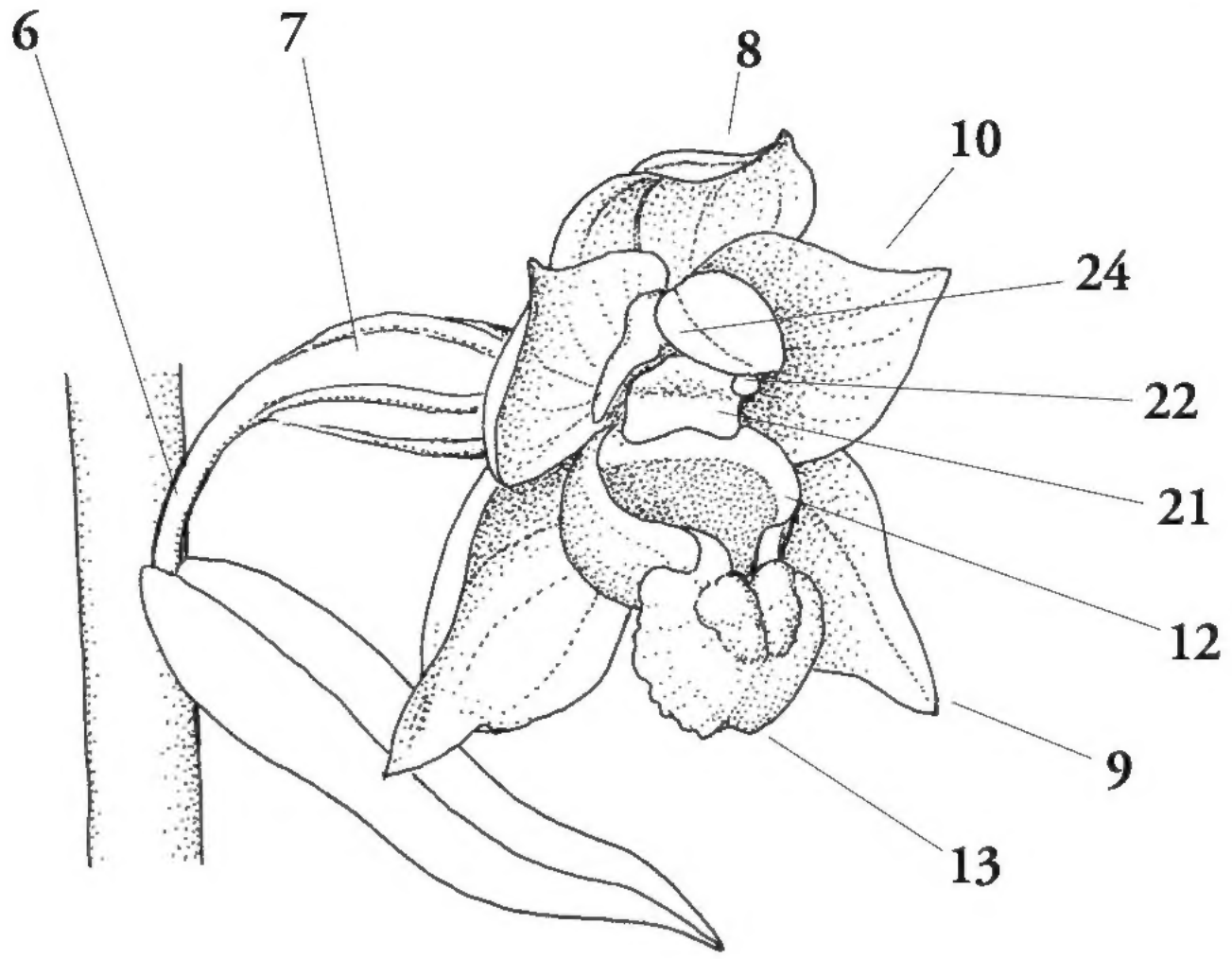
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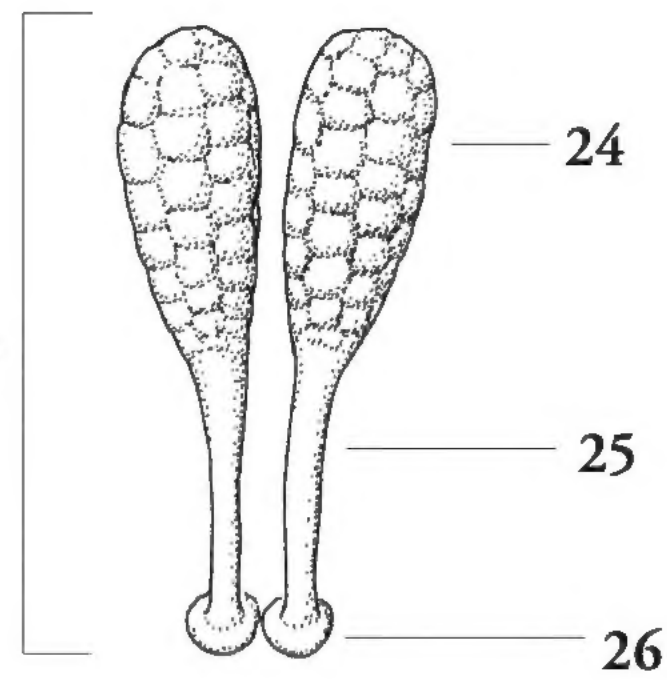
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symbiotic association between the roots of a plant and a fungus is called "mycorrhiza".

Certain orchids (in Italy all those in the genera *Corallorhiza*, *Epipogium*, *Limodorum*, and *Neottia*) never produce green leaves and depend entirely on the substances furnished by the fungus for the whole length of their existence. These are commonly termed "saprophytes" although they are true parasites.

Very few seeds find the necessary conditions to develop into adult plants and it is for this reason that huge numbers of seeds are produced. In order to produce such a quantity of seeds the pollen is not dispersed but is united in masses. It is not worthwhile for the plant to invest its energy in producing too few seeds for any of them to find the peculiar conditions necessary for germination. The pollen masses are too heavy to be transported by the wind. In Italian orchids they are carried by insects, and to attract them the orchids have become highly specialised, adopting varied and sometimes extraordinary strategies, accompanied by diversified and decidedly peculiar floral structures. The various pollination mechanisms are described in the sections dedicated to the separate genera. For more detailed information on this subject consult the book by van der Cingel (1995) which summarizes all the previous studies.

Conservation problems

Some species of orchids are very widespread and common in Italy and present no problems of preservation. Others are very local or are restricted to particular environmental situations, which render them much more vulnerable or even at risk. In our country, for example, many of the orchids growing on wet areas, such as *Orchis palustris*, *Spiranthes aestivalis*, *Liparis loeselii*, etc., have shown a worrying decline. Without a doubt, species restricted to this type of habitat are the most at risk here; not least because of the noticeable reduction in precipitation in peninsular Italy in the last few years and the inexorable lowering of the water tables. It is no surprise that the two rarest species in Italy, i. e. *Dactylorhiza elata* and *Hammarbya paludosa*, grow in wet areas.

Every type of alteration of the environment claims its victims. For example, excessive construction along the coast has drastically reduced populations of *Gennaria diphylla* in northern Sardinia, and the building of new ski-lifts and runs in the central Apennines has damaged certain populations of the rare O*rchis spitzelii*.

As I have had occasion to notice many times personally, even collecting and a misinterpreted "love of nature" end up resulting in damage, at times irreparable.

Classification of Italian orchids

Recent studies based chiefly on molecular markers have revolutionized the classification of orchids on every taxonomic level. The Orchidaceae family is currently divided into 5 subfamilies: Apostasioideae (not represented in Europe, made up of few species possessing 3 fertile stamens), Cypripedioideae (2 fertile stamens, represented in Italy only by *Cypripedium calceolus*), Vanilloideae (not represented in Europe, one fertile stamen with paste-like pollen), Epidendroideae (one fertile stamen with pollen forming solid masses, roots rarely enlarged), Orchidoideae (one fertile stamen with pollen forming solid masses, root-tubers nearly always present).

At the genus level, on the basis of a study on a portion of DNA, a new classification has recently been proposed which would split up the genus *Orchis* and considerably rearrange related genera

(Pridgeon et al., 1999). The technique used, however, is not the most suitable for phylogenetic studies, and the resulting nomenclature should be considered provisional. For this reason traditional nomenclature has been maintained in this book.

At a species level the situation is no less than chaotic. The number of "new" species has grown in an exponential manner in recent years, in spite of the fact that studies using molecular markers suggest greater caution. Also in this case traditional classification has been maintained, conditioned also by the choices of the artist.

Under these circumstances, I must conclude that now is not perhaps the best moment to put pen to paper to write about orchids.

Key to the gener

1	Plants without green leaves	**2**
1*	Plants with green leaves	**5**
2	Flowers with spur and lip directed upwards	***Epipogium***
2*	Spur, if present, and lip directed downwards	**3**
3	Plant wholly violaceous; spur present or absent	***Limodorum***
3*	Plant brownish or yellowish; flowers lacking a spur	**4**
4	Lip uniformly yellowish-brown, clearly bilobed at the apex	***Neottia***
4*	Lip white with purplish blotches, and with entire apex	***Corallorhiza***
5	Leaves conspicuously net-veined	***Goodyera***
5*	Leaves with parallel veins	**6**
6	Flowers lacking a spur	7
6*	Flowers with a spur	**19**
7	Lip velvety or hairy, resembling the abdomen of an insect or a spider	***Ophrys***
7*	Lip not as above	**8**
8	Lip large, swollen; lateral sepals fused for most of their length	***Cypripedium***
8*	Lip and sepals not as above	**9**
9	Lip divided by a constriction into a concave basal part (hypochile) and a distal part (epichile)	**10**
9*	Lip not as above	**12**
10	Flowers with sepals joined for most of their length	***Serapias***
10*	Flowers with free sepals	**11**
11	Ovary not stalked, erect, subcylindrical	***Cephalanthera***
11*	Ovary shortly stalked, horizontal or pendent, more or less inflated	***Epipactis***
12	Flowers small and whitish, arranged in an elongate spiral row	***Spiranthes***
12*	Flowers not arranged in a spiral row	**13**
13	Leaves very narrow, linear, at least as long as the stem	***Chamorchis***
13*	Leaves wider, clearly shorter than the stem	**14**
14	Lip entire	**15**
14*	Lip clearly lobed	17
15	Lip clearly smaller than sepals	***Hammarbya***
15*	Lip wider than and about as long as sepals	**16**
16	Lip with acute apex pointing upwards	***Malaxis***
16*	Lip arched, saddle-shaped, with rounded apex	***Liparis***
17	Lip bilobed	***Listera***
17*	Lip trilobed	**18**
18	Lip mid-lobe entire	***Herminium***
18*	Lip mid-lobe bifid	***Orchis anthropophora***
19	Lip mid-lobe strap-like, more than 3 cm long	***Himantoglossum***
19*	Lip not as above	**20**
20	Lip entire, erect, pointing upwards	***Nigritella***
20*	Lip not as above	**21**
21	Flowers with lip entire, more than 3 times as long as broad, and with a slender spur longer than the ovary	***Platanthera***
21*	Flowers not as above	**22**

22 Plant with only 2, well spaced leaves; flowers small and greenish ..... ***Gennaria***

22* Plant with more than 2 leaves **23**

23 Spur shorter than 3 mm, subspherical or saccate **24**

23* Spur longer than 3 mm; or about 3 mm long, but not subspherical nor saccate **25**

24 Lip mid-lobe clearly shorter than the side lobes ..... ***Coeloglossum***

24* Lip mid-lobe clearly longer than the side lobes ..... ***Neotinea***

25 Flowers small, whitish or yellowish, with the lip not longer than 4 mm ..... ***Pseudorchis***

25* Flowers larger; or small with dark sepals **26**

26 Sepals with spathulate apex ..... ***Traunsteinera***

26* Sepals with acute, obtuse or rounded apex, never spathulate **27**

27 Flowers with a very slender spur, longer than or about as long as the ovary, and with unspotted lip ... **28**

27* Flowers with the spur of different widths; if very slender, with the lip dotted at the base **29**

28 Lip mid-lobe bearing 2 longitudinal basal ridges; inflorescence short, conical to ovate ..... ***Anacamptis***

28* Lip mid-lobe without basal ridges; inflorescence elongate, subcylindrical ..... ***Gymnadenia***

29 Flowers large, with the lip 15-20 mm long, deeply trilobed, with its outer margins clearly undulate; lower bracts exceeding the flower in length ..... ***Barlia***

29* Flowers lacking at least 2 of the characters given above **30**

30 Floral bracts much longer than the ovary, the lower ones usually exceeding the flower in length; apex of upper leaves often exceeding the base of the inflorescence ..... ***Dactylorhiza***

30* Floral bracts shorter or slightly longer than the ovary; apex of upper leaves seldom reaching the base of the inflorescence ..... ***Orchis***

ANACAMPTIS L.C.M. Richard

The genus *Anacamptis* was established solely for *A. pyramidalis*, which is characterized by two converging ridges at the base of the lip and a single transversely elongate viscidium. Recent research has shown its affinity with certain *Orchis* species (Pridgeon et al., 1997; Aceto et al., 1999). This poses interesting taxonomical problems which merit further investigation.

The chromosome number is 2n=36.

The flowers of *A. pyramidalis* are perfectly adapted to pollination by butterflies and moths. The two converging ridges at the base of the lip help guide their long proboscis to the narrow opening of the long, slender spur containing nectar. During this operation the insects remove the pollinia, whose long viscidium rapidly contracts encircling the proboscis and sticking tight to it.

x 2

Anacamptis pyramidalis (Linnaeus) L.C.M. Richard

Description

Plant 20-60 cm tall, with a relatively slender stem. Lower leaves keeled, narrowly lanceolate, acute, sub-erect, the upper ones progressively smaller and sheathing the stem. Inflorescence very dense, at first conical, then ovoid when mature. Bracts often tinged violet, narrow and pointed, about as long as the ovary. Sepals broadly lanceolate, the lateral ones spreading, the median curving forward to form a loose hood with the petals, which are slightly broader and shorter. Lip deeply trilobed, with mid-lobe similar to or narrower than the side lobes, bearing at the base two narrow ridges slightly diverging forwards; spur very slender, longer than the ovary, curved downwards. Flower colour is pale to dark pink, but populations or single plants with flowers very intensely coloured or pure white are not infrequent.

Flowering period

April to June.

Geographical distribution

Mediterranean-Atlantic, from Ireland and Morocco westwards, to the Caspian Sea eastwards.

Habitat

Grassland and garrigue, up to 1400 m, on dry, calcareous soil.

Status and conservation

Widespread throughout the country.

Tuscany (PO), near Figline.

BARLIA Parlatore

This genus is closely allied to *Himantoglossum*, from which it differs in having a shorter lip and longer bracts.

The chromosome number is 2n=36.

The large and scented flowers contain very little nectar and are pollinated chiefly by bumblebees.

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Barlia robertiana (Loiseleur) Greuter

Systematics

Synonyms: *Himantoglossum longibracteatum* (Bivona-Bernardi) Schlechter.

Description

Robust plant, 25-80 cm tall. Stem thick, tinged with violet or with brown in the upper portion. Leaves shiny, pale green, the lower ones quite large, oblong-ovate, the upper ones smaller, sheathing the stem. Inflorescence dense, at first conical, then elongate and cylindrical, composed of many large, sweetly scented flowers. Bracts narrowly lanceolate, shaded with violet or with brown, the lower ones exceeding the flowers in length. Sepals concave, ovate, converging to form with the petals a loose hood, greenish and more or less tinged with violet outside, paler and spotted with purple inside. Petals linear, truncate at the apex. Lip quite large, deeply trilobed, with side lobes sickle-shaped, with crinkled margins, and a much longer mid-lobe divided into two diverging, obtuse segments; the colour is whitish or very pale pink with purplish spots and streaks in the centre and at the base, while the edges are darker, olive-green to violet; spur short, conical, pointing downwards.

Flowering period

From mid January to the beginning of May.

Distribution

Mediterranean.

Habitat

Poor grassland, garrigue, and scrub, up to 1000 m, on dry calcareous soil.

Status and conservation

In Italy it is found in the south, on the islands, in Liguria, in Tuscany, in Lombardy (a single record from Lake Garda) , in Emilia Romagna, in Umbria (a single record near Perugia), in Abruzzo and in Molise.

A single specimen of this orchid has been recently found in the Veneto region (Doro, 2002). It is possible that in the near future, because of the general rise in temperature, records in northern Italy of species with a southern range will become more and more frequent (see also *O. collina*).

Sardinia (SS), near Platamona Lido

Cephalanthera L.C.M. Richard

Similar to *Epipactis* in that its underground portion consists of a rhizome, sepals and petals are similar to each other, the lip is divided into two sections, and viscidia are lacking. It differs from Epipactis in having a subcylindrical ovary which is not stalked, and a longer column.

The chromosome number differs in the three Italian species: 2n=32 (*C. longifolia*), 36 (*C. damasonium*), 44 (*C. rubra*).

The flowers of *Cephalanthera* lack nectar and are pollinated by Hymenopterans which mistake the yellow crests on the lip for stamens full of pollen, with which they feed their larvae. Self-pollination is also very common, especially in *C. damasonium.*

Key to the genus Cephalanthera

1	Sepals and petals pink; ovary pubescent	***C. rubra***
1*	Sepals and petals white or cream coloured; ovary glabrous	**2**
2	Leaves elliptic, quite broad; upper bracts longer than ovary	***C. damasonium***
2*	Leaves quite long and narrow; upper bracts very short	***C. longifolia***

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cm

Cephalanthera damasonium (Miller) Druce

Status and conservation

Reported from all Italian regions, but less common in the south.

Description

Plant 15-50 cm tall. Leaves clasping, well spaced, the lower ones small and ovate, the upper ones larger, broadly elliptic, acute. Inflorescence lax, composed of 3-15 relatively large, whitish or creamy flowers, which usually open very little. Bracts quite large, lanceolate, the lower ones leaf-like and up to twice longer than flowers. Sepals broadly lanceolate, acute. Petals obtuse, slightly shorter than sepals. Lip strongly concave, shorter than sepals; epichile longer than hypochile, heart-shaped, with 3-4 longitudinal orange ridges, wavy margins, and downwards curved tip.

Flowering period

From May to mid July.

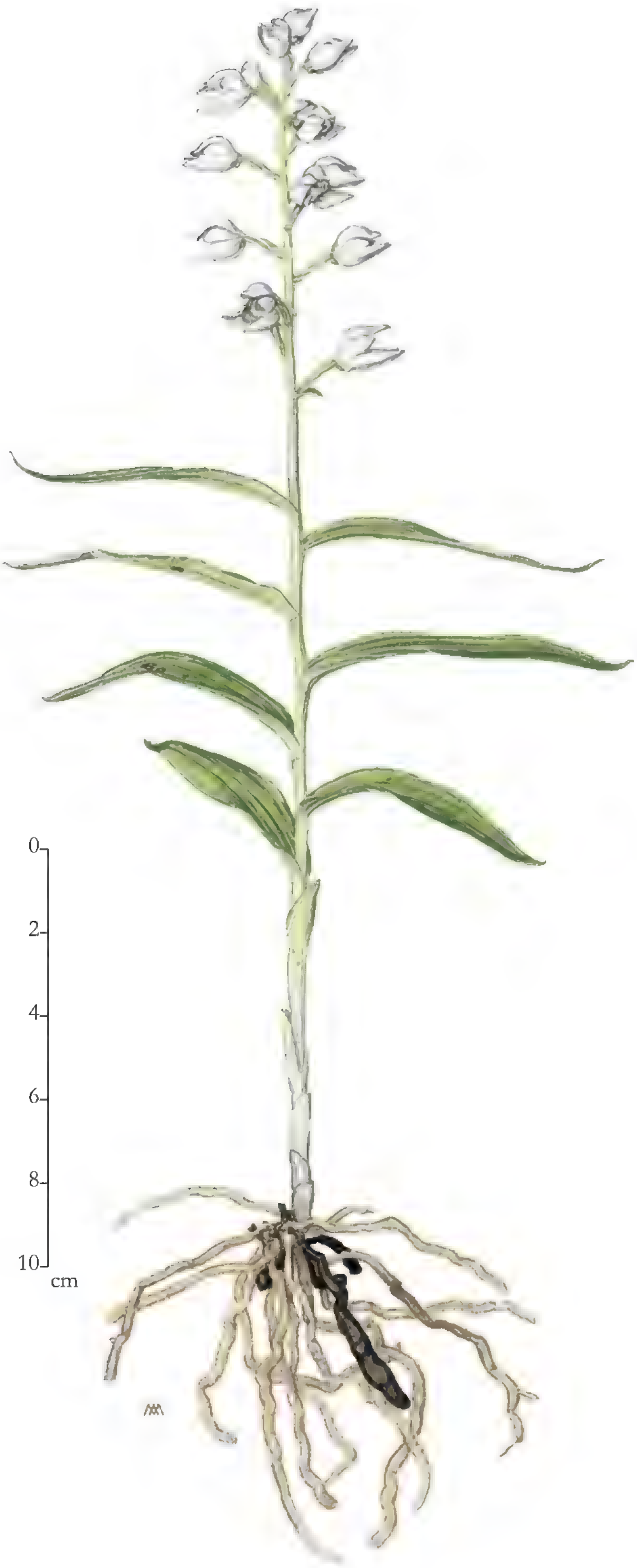
Geographical distribution

Eurasian.

Habitat

Woodland and scrubland, up to 1800 m, on calcareous soil.

Tuscany (FI), Pratolino, pine-wood along the road to M. Morello, m 530.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Cephalanthera longifolia (Linnaeus) Fritsch

Habitat

Open woodland, glades and scrubland, usually in semi-shade, tolerant to both dry and damp conditions, up to 1800 m, on calcareous soil .

Status and conservation

Widespread in all Italian regions.

Description

Plant 15-60 cm tall. Leaves broadly arranged in two rows, the lower ones smaller and elliptic, the upper ones quite long, narrowly lanceolate, frequently erect. Inflorescence rather lax, composed of 10-20(30) flowers which usually do not open fully. Bracts very small except the lowest, which is longer than the ovary. Sepals and petals pure white, the former lanceolate and acute, the latter slightly shorter and obtuse. Lip shorter than sepals, concave, white for the most part, bearing a few longitudinal yellowish ridges, the tip orange, rounded, papillose, curved downwards.

Flowering period

From April to July.

Geographical distribution

Mainly Eurasian, also present in North Africa (Algeria, Tunisia, and Morocco).

Tuscany (FI), Pratolino, pine-wood along the road to M. Morello, m 530.

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Cephalanthera rubra (Linnaeus) L.C.M. Richard

Description

Plant 15-60 cm tall. Stem slender, somewhat flexuous, pubescent. Leaves broadly lanceolate, acute, clasping, usually well spaced. Inflorescence lax and elongate, composed of 3-15(20) flowers. Bracts narrow and acute, the lower ones longer than the flowers, the others gradually smaller, but always longer than the ovary. Sepals purplish-pink, paler at the base, lanceolate, acute, pubescent outside, the laterals spreading, the dorsal directed forwards. Petals similar to the sepals, directed forwards, their tips bent outwards. Lip as long as the sepals, with a concave, light pink hypochile, and a much longer, whitish epichile which bears several longitudinal yellowish ridges and a purplish, acute apex.

Flowering period

From the end of May to the end of July.

Geographical distribution

Eurasian, also present in North Africa (Morocco and Algeria).

Habitat

Woodland margins, coastal pinewoods, scrubby grassland, up to 1800 m, mainly on calcareous soil.

Status and conservation

Although reported from all the Italian regions, this species is quite uncommon in the south.

Tuscany (FI), Pratolino, Parco Demidoff, m 450.

CHAMORCHIS L.C.M. Richard

A monospecific genus, characterized by ellipsoidal tubers, leaves all basal and very narrow, flowers lacking a spur, with pollinia each bearing a short caudicle and distinct viscidium covered by a bursicle

The chromosome number is 2n=42.

The tiny flowers are pollinated by small insects, often minute flies. A high level of self-pollination is also reported; this is confirmed by the abundant seed production in habitats unfavourable for insects.

x 4

Chamorchis alpina (Linnaeus) L.C.M. Richard

Description

Tiny plant, from 5 to 12 cm tall. The grass-like leaves are all basal, linear, grooved, sometimes exceeding the inflorescence. Inflorescence variably dense, oval to cylindrical, with 4 to 14 flowers. Bracts green, triangular, acute, the lower ones much longer than the flowers, the others progressively shorter. Sepals oval, yellowish-green to purplish-brown, forming a hemispherical hood. Petals paler, slightly smaller, and entirely hidden by the sepals. Lip without a spur, hanging, tongue-like, obscurely trilobed, yellowish with a green longitudinal groove in the middle.

Flowering period

July to August.

Geographical distribution

European, usually confined to the high mountains, at lower altitudes in Scandinavia. In Italy it is found only in the Alpine chain.

Habitat

Alpine meadows, from 1800 to 2600 m, on dry, calcareous soil.

Status and conservation

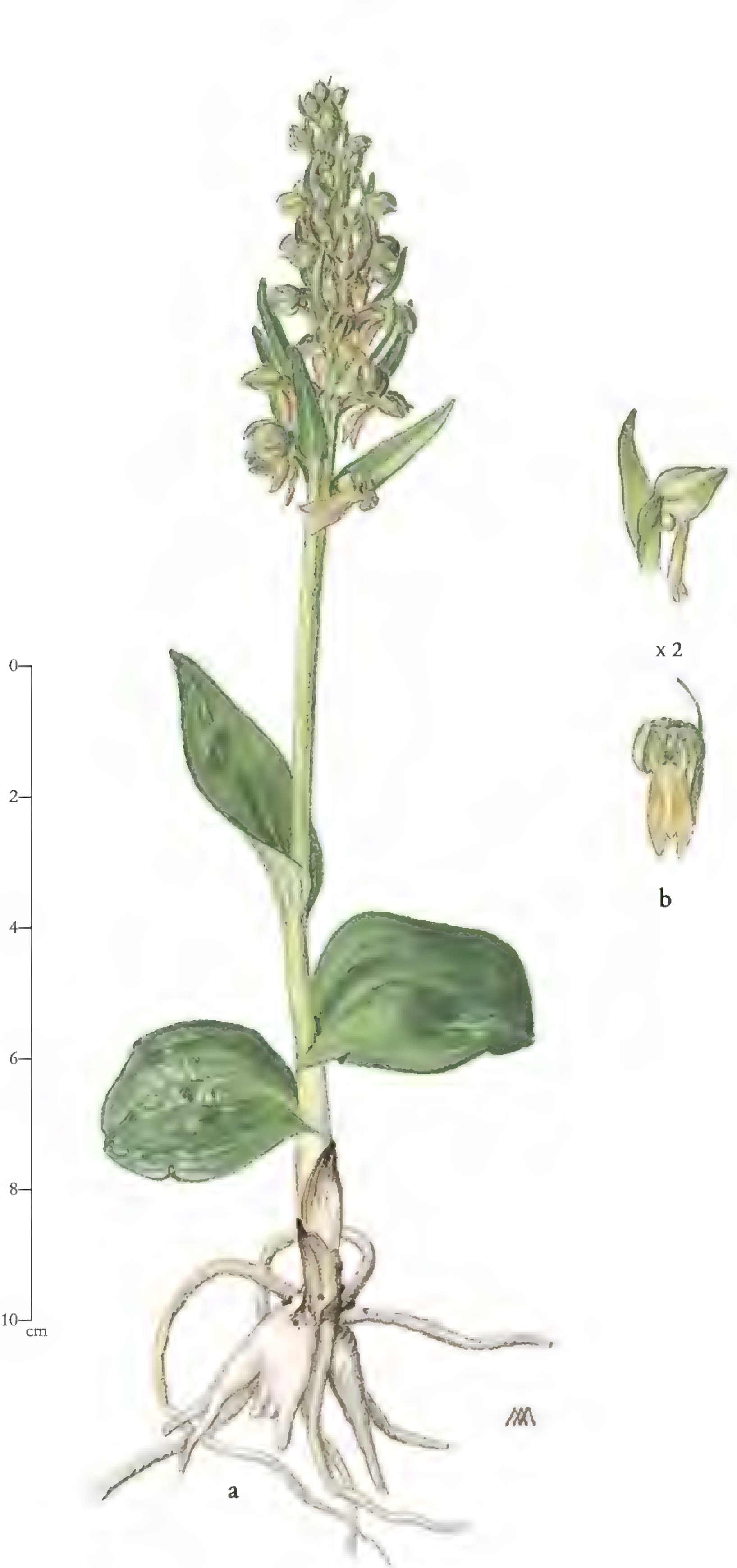
This species is the smallest orchid in our country and, because of its green colour and grass-like leaves, it is easily overlooked.

Lombardy (BS), Passo del Tonale, Cima di Cadi, m 2400.

COELOGLOSSUM Hartmann

Recent studies using molecular markers (Pridgeon et al., 1997) have shown that *Coeloglossum viride* is very closely related to the species of *Dactylorhiza*, in spite of their marked morphological differences. On the basis of these unexpected results, synonymy between the genera *Coeloglossum* and *Dactylorhiza* has been proposed. As a consequence of this all the species of *Dactylorhiza* would be transfered to the genus *Coeloglossum*, because having been described first it has priority. To avoid this dramatic change in nomenclature it has been suggested to retain the name *Dactylorhiza* at the expense of *Coeloglossum* (Bateman et al., 1997), which would result in changing the name of only the one species included in this genus. Since the special committee has yet to decide the question, the distinction between the two genera has been maintained.

The flowers of *Coeloglossum viride* are pollinated by numerous insects, mainly beetles and small Hymenopterans, attracted by the nectar which flows down the lip.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Coeloglossum viride (Linnaeus) Hartmann

Geographical distribution

Circumboreal, widespread throughout Europe (except Portugal), but less common in the south.

Habitat

Poor grassland, alpine pastures, scrubland, woodland edges, between 500 and 3000 m, on acidic or alkaline, dry to damp soil.

Status and conservation

Absent from the islands, reported from all the other Italian regions, progressively less common in the south.

Description

Plant 20-30 cm tall. Leaves clasping, the lower broadly elliptic, with obtuse apex, the upper lanceolate, gradually narrower. Inflorescence elongate, cylindrical, more or less dense, composed of (5)10-25 greenish flowers. Bracts green, narrow and acute, exceeding or equalling the flowers. Sepals ovate, obtuse, converging to form a hood, green or yellowish green, sometimes tinged with brown. Petals about as long as the sepals but much narrower, linear-lanceolate. Lip longer than sepals, strap-like, pendant or folded backwards, trilobed at the apex, the mid-lobe being much smaller and tooth-like; lip colour is green, yellowish-green, or more or less tinged with purplish-brown; spur globose, not exceeding 3 mm.

Flowering period

From mid May to mid August

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a. Lombardy (BS), Val Camonica, near Bazena, Croce Domini, m 2000; b. Tuscany (LU), Alpi Apuane, M. Corchia, m 1450.

CORALLORHIZA Gagnebin

Underground portion consisting of a short, flattened rhizome, shaped like a branch of coral, which produces stems lacking green leaves. The flowers lack a true spur, have a long column, small rostellum, and pollen divided into four masses which are united in two pairs, each with a distinct viscidium without bursicle.

This genus is almost exclusively American with only one species reaching Europe.

The chromosome number is 2n=42.

The small nectarless flowers are predominantly self-pollinating. The pollen, in fact, usually does not adhere to the bodies of the few visiting insects, but finally falls onto the stigma.

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Corallorhiza trifida Châtelain

Habitat

Mature mountain woodland rich with leaf mould, from 700 to 2100 m.

Status and conservation

In Italy it is locally common and sometimes abundant in the north, becoming localized and very rare southwards; it has not been reported in Apulia so far; absent in the islands.

Description

Stems slender, yellowish green,10-20(25) cm tall, with the lower portion sheathed by 3-4 reduced, scale-like leaves. Inflorescence usually lax, 3-12 flowered. Bracts very small, acute. Sepals narrowly oblong with obtuse apex, yellowish-green, sometimes margined with red. Petals slightly shorter and broader than sepals, frequently spotted with brownish-red near the base, forming a loose hood with the median sepal. Lip oblong, slightly shorter than sepals, white with red blotches, with longitudinal ridges, wavy margin, rounded apex, and very small side lobes near the base.

Flowering period

From the end of May to the end of July.

Geographical distribution

Circumboreal, widely distributed in northern and central Europe, less common in western and southern Europe.

Tuscany, Alpi Apuane, Pizzo d'Uccello, m 1450.

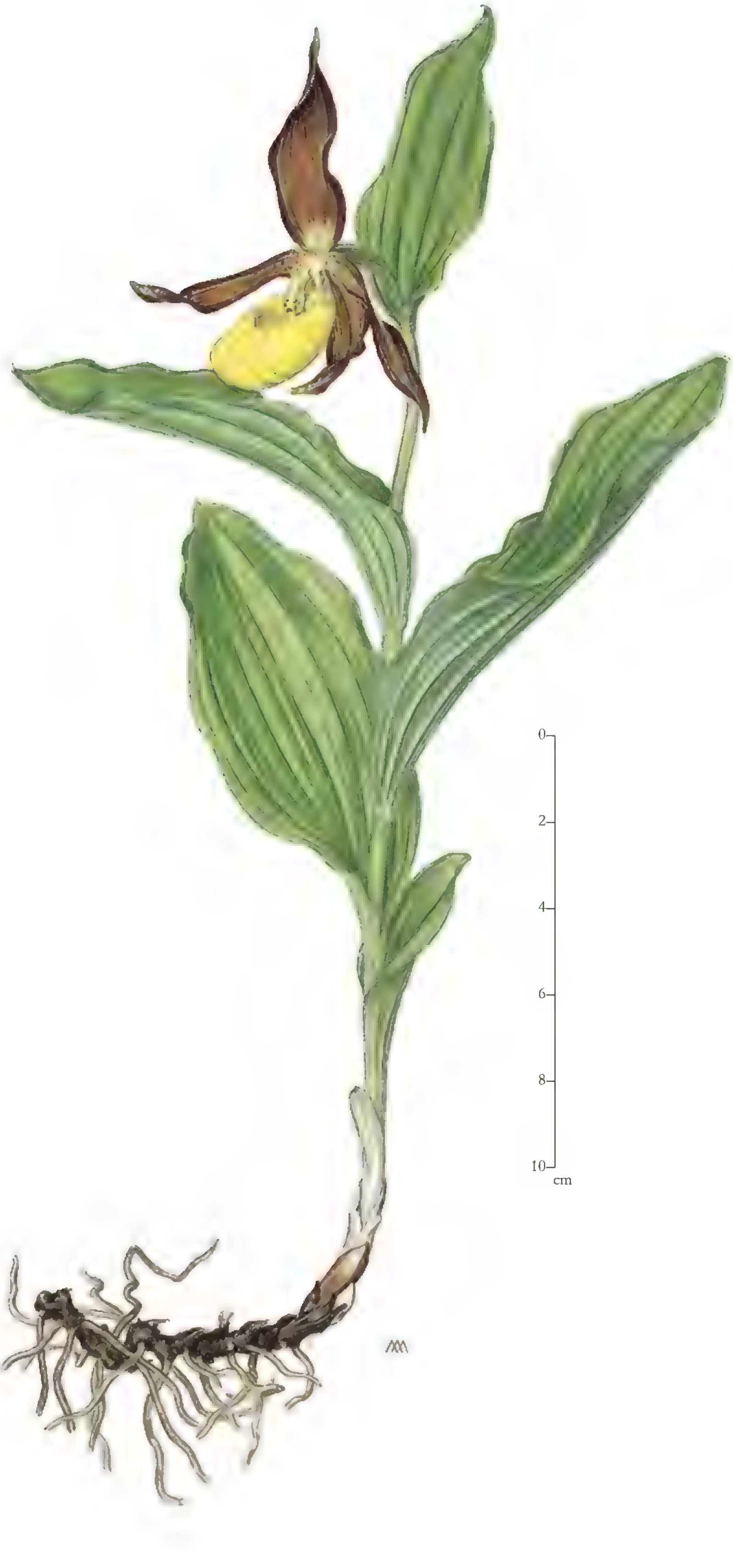
CYPRIPEDIUM Linnaeus

A genus of almost 50 species distributed over North and Central America, Asia and Europe. In Italy and western Europe the only species present is *Cypripedium calceolus*, which is also the only Italian orchid having two fertile stamens (all the others have only one). Other characteristics are the large, inflated lip and the lateral sepals fused together. The underground portion is made up of a creeping rhizome bearing elongate roots.

The chromosome number is 2n=20.

Cypripedium calceolus is pollinated principally by solitary bees of the *Andrena* genus which are attracted by the bright yellow colour of the lip. Once they have landed on the lip, they usually fall into the large central opening of the same, but cannot crawl out because the borders of the hole are folded in, forming a sort of funnel. To escape from this trap the bees are forced to crawl out through one of the two small apertures at the base of the lip, first rubbing their backs against the surface of the stigma, depositing there any pollen they have collected from another flower, and then carrying off the sticky pollen from one of the two fertile anthers situated in correspondence with the two apertures.

The percentage of fertilized flowers is usually low in Italian populations, but the same population may show important variations in the number of capsules produced from one year to another.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Cypripedium calceolus Linnaeus

Description

Plant 20 to 50 cm tall. Stems pubescent. Leaves 3-4, broadly elliptic, sheathing, pubescent along the margins and the prominent veins, with an acuminate apex. Flowers 1 or 2, quite large. Bracts large and leaf-like. Dorsal sepal erect or curved forwards, broadly lanceolate, reddish-brown; lateral sepals are fused together and look like the dorsal sepal, but point downwards in the opposite direction. Petals slightly longer than sepals, divergent, strap-like, twisted, reddish-brown, pubescent and paler near the base. Lip swollen, slipper-shaped, bright yellow, with red dots and veins inside.

Flowering period

From the end of May to mid July.

Geographical distribution

Eurasian, absent from most of southern Europe.

Habitat

Woodland and mountain scrubland, frequently associated with Mountain Pine, between 400 and 2300 m, on calcareous soil.

Status and conservation

In Italy it is more frequent in the eastern Alps, quite rare in the rest of the Alpine chain; it is also present in the central Apennines with two small populations, one of which is in the Abruzzo National Park, the other in the Maiella National Park. In spite of being situated within protected areas, the two Apennine populations are particularly vulnerable because they are made up of only a few individuals which, in addition, have a low genetic variability.

Cypripedium calceolus is one of the four Italian orchids listed in Appendex II of the Washington Convention on International Trade in Endangered Species (CITES); the other three are *Liparis loeselii*, *Ophrys lunulata*, and *Spiranthes aestivalis*. Within the countries of the European Union only, these four orchids are afforted a higher level of protection since they are listed in Annex A of the regulation which enforces the CITES convention.

Veneto (VI), Altipiano di Asiago, along the path to Cima della Caldiera.

DACTYLORHIZA Necker ex Nevsky

Up to fairly recently the species in this genus were included in the genus *Orchis*; only since the publication of the works of Soó (1960) and Nelson (1976) has the distinction between *Dactylorhiza* and *Orchis* been generally accepted.

The genus *Dactylorhiza* differs from the genus *Orchis* mainly in having tubers more or less divided at the apex (slightly divided in *Dactylorhiza insularis*, *D. romana* and *D. sambucina*, more deeply divided in the other species; see pertinent plates), floral bracts distinctly longer than the ovary (they are shorter than the ovary in most *Orchis* species and subequal to the ovary only in *Orchis laxiflora*, *O. mascula*, *O. palustris* and *O. papilionacea*), and the bursicle distinctly bilobed (more or less rounded or slightly lobed in *Orchis*). The two genera have also different chromosome numbers: 2n=40, 80 or more rarely 60 in *Dactylorhiza*; 2n=42, 36 or more rarely 32 and 84 in *Orchis*.

The taxonomy of *Dactylorhiza* is among the most complex and controversial, as will become evident when dealing with the single species.

The pollination mechanism has been the object of much study, especially in *D. sambucina* and *D. maculata*. The former is pollinated by inexpert bumblebees attracted by visual stimuli; it is believed that the chromatic variability of *D. sambucina* flowers is useful to the plants in that it keeps the bumblebees from learning too rapidly to avoid these nectarless flowers. In *D. maculata*, which also has nectarless flowers, the most efficient pollinators seem to be beetles, mainly longhorns (Cerambicidae), which eat the viscous substances produced by the stigma. Numerous other insects including flies and Hymenopterans also visit the flowers of this orchid; I have been able to observe and photograph plants of this species being pollinated by large Hymenopterans belonging tho the genera *Bombus* (bumblebees) and *Xycocopa* (carpenter bees).

Key to the genus Dactylorhiza

1 Lip unspotted; spur bent upwards ..... ***D. romana***

1* Lip variably dotted, spotted or streaked; spur horizontal or pointing downwards **2**

2 Flowers yellow, with 1-4 red specks near the base of the lip (seldom missing); spur straight, cylindrical, subhorizontal ..... ***D. insularis***

2* Flowers pinkish, reddish or purplish; otherwise yellow, but with the lip bearing purplish dots and streaks and a subconical spur clearly pointing downwards **3**

3 Spur subconical, as long as the ovary, clearly pointing downwards ..... ***D. sambucina***

3* Spur lacking at least one of the characters reported above **4**

4 Leaves unspotted or spotted on both sides **5**

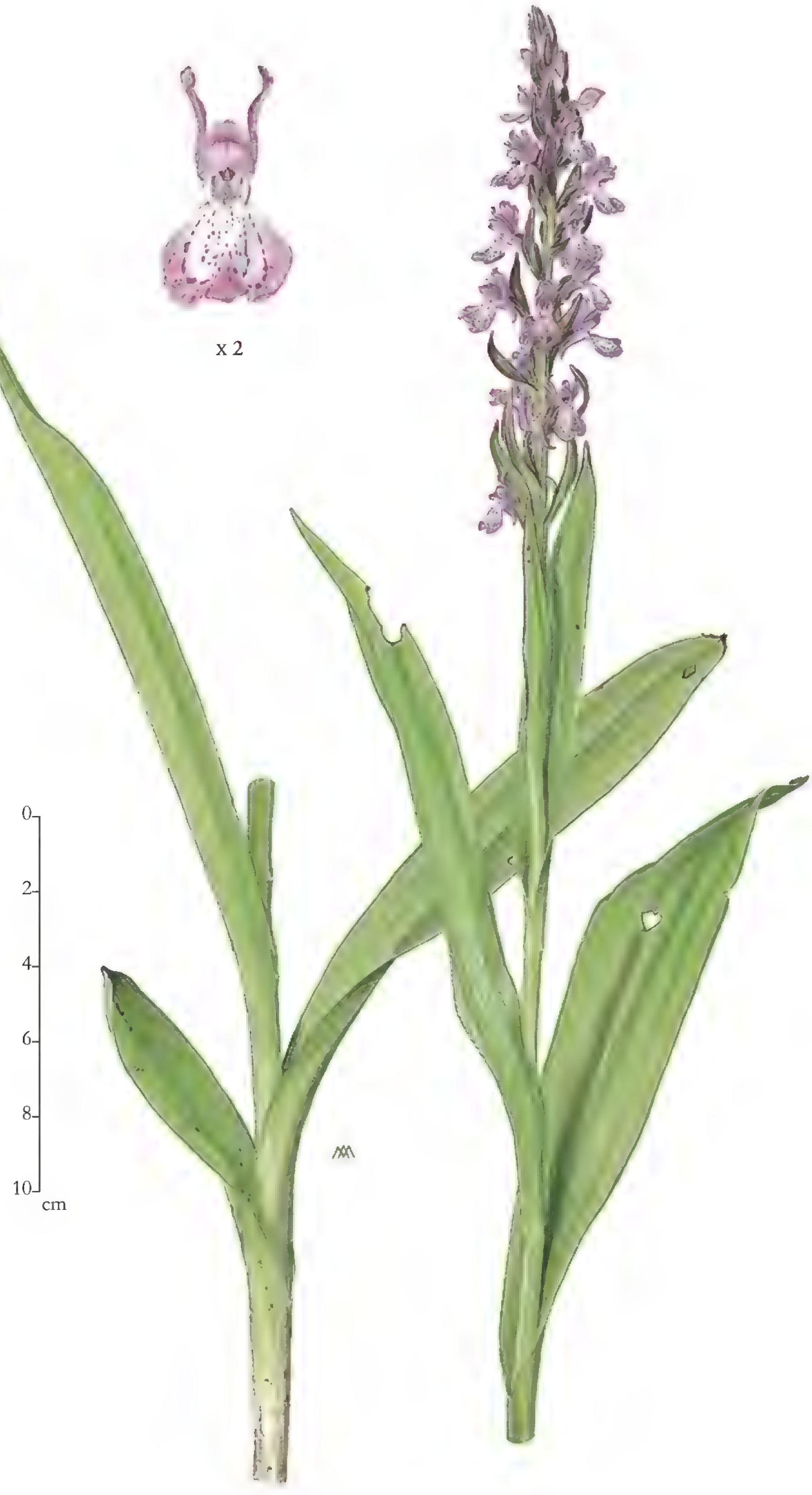
4* Leaves spotted only on the upper surface **6**

5 Flowers relatively small; lip less than 8 mm long ..... ***D. incarnata***

5* Flowers relatively large; lip more than 9 mm long ..... ***D. elata***

6 Stem solid; flowers coloured pale to dark pink ..... ***D. maculata***

6* Stem hollow in the upper portion; flowers usually darker, coloured violet-red, purplish-red or magenta ..... ***D. majalis***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Dactylorhiza elata (Poiret) Soó

Systematics

The Italian and other European populations are frequently reported as *D. elata* subsp. *sesquipedalis* (Willdenow) Soó, a subspecies of very little taxonomic value.

Description

Usually robust plant 30-90 cm tall, with a fairly thick, hollow stem. Leaves unspotted, suberect, sheathing the stem with their basal portion, the lowermost short and ovate, the others narrowly elliptic, the upper lanceolate. Inflorescence cylindrical, elongate, quite dense, many flowered. Bracts narrowly lanceolate, acute, bordered with dull red, much longer than the flowers. Flower colour pink to lilac, much paler at the base of the lip. Lateral sepals broadly lanceolate, spreading, their tips sometimes curved upwards; dorsal sepal directed forwards, forming a loose hood with the petals. Lip hardly trilobed, with the mid-lobe small and frequently curved downwards, dotted and streaked with purplish red; spur conical, slightly arched, pointing downwards, shorter than the ovary.

Flowering period

From mid May to mid July.

Geographical distribution

Western-Mediterranean: Tunisia, Algeria, Morocco, Iberian Peninsula, southern France, Corsica, and Sardinia.

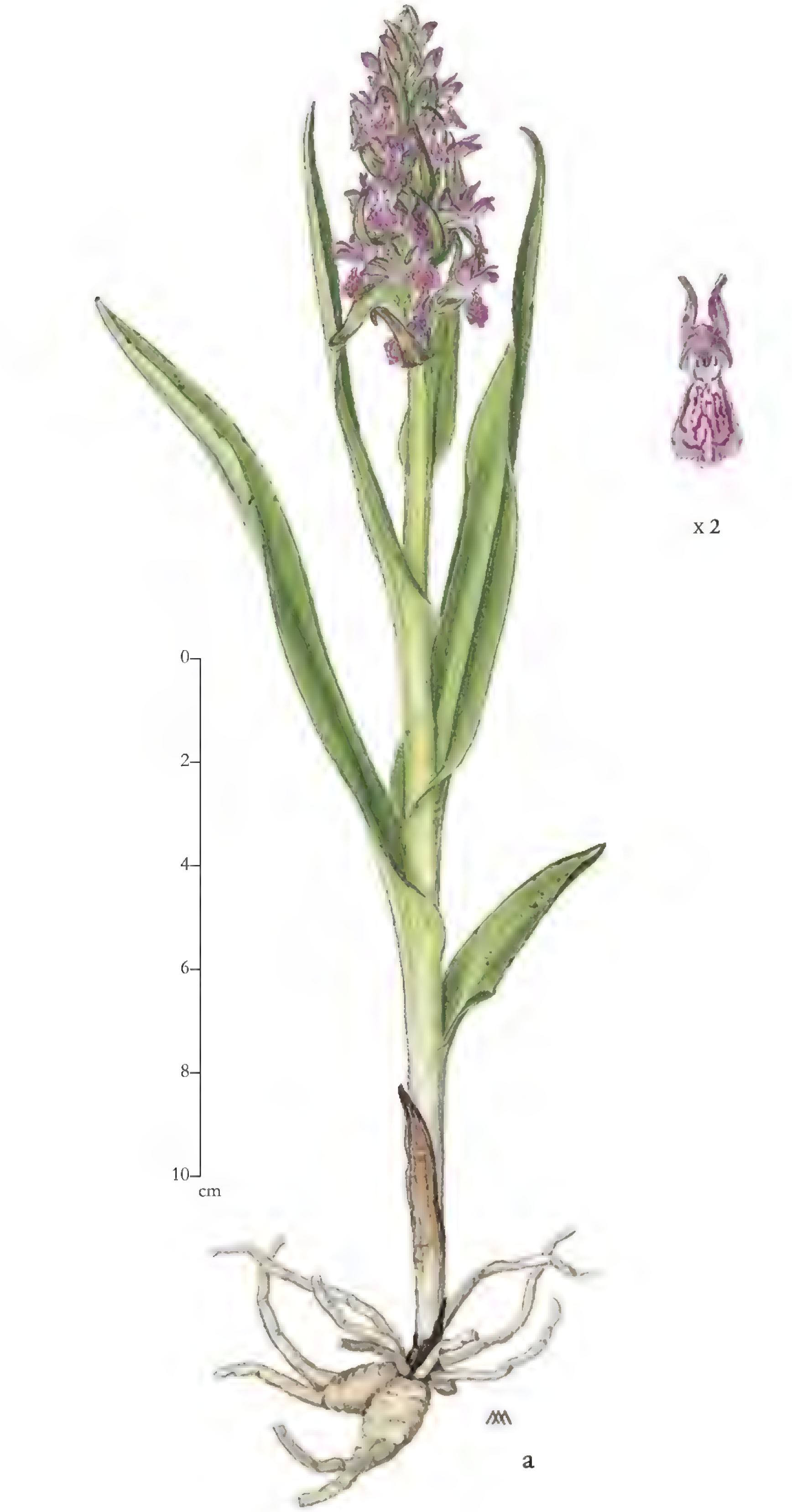
Habitat

The single Italian population is found on the damp sides of a stream, at about 800 m, on calcareous soil.

Status and conservation

Undoubtedly it is one of the rarest orchids in Italy, where it is represented by a single population composed of some twenty specimens located in the Ogliastra (mid eastern Sardinia).

Sardinia (NU), Osini, Tacchi di Ogliastra, m 800.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Dactylorhiza incarnata (Linnaeus) Soó

Systematics

In northern Italy two varieties have been reported: var. *haematodes* Reichenbach fil., characterized by dark spots on the upper surface of the leaves (fig. b), and var. *hyphaematodes* (Newman) Landwehr, which has spots on both sides of the leaves (fig. c). In most cases these plants originate from hybridization, chiefly with *Dactylorhiza majalis*.

The presence has been reported in two localities in the Emilian Apennines of *D. incarnata* subsp. *praetermissa* (Druce) Sundermann [= *D. praetermissa* (Druce) Soó] (Bongiorni, 1989). Genetic analysis of one of these two populations has shown that the plants are no more than robust individuals of *D. incarnata*.

In the Alps at high altitudes (between 1400 and 2400 m) one sometimes finds populations consisting of rather stocky plants, 10-30 cm tall, with a short inflorescence of intensely coloured flowers and distinguished above all by wider leaves with extensive blotching on both surfaces (fig. d). These plants are habitually attributed to subsp. *cruenta* (O.F. Müller) P.D. Sell, but genetic analysis has not revealed sufficient differences for them to merit the rank of subspecies, much less that of species [= *D. cruenta* (O.F. Müller) Soó], to which, by now, they are frequently assigned.

Description

Plant 20-60 cm tall, rarely more, with a thick, hollow stem. Leaves spaced along the stem, usually unspotted, suberect, sheathing, lanceolate, keeled, the apex of the upper ones exceeding the base of the inflorescence. Inflorescence cylindrical and elongate, more rarely ovoid, quite dense, composed of many, relatively small flowers. Bracts narrowly lanceolate, acute, margined or flushed with purplish-red, distinctly longer than the flowers. Lateral sepals broadly lanceolate, usually erect; dorsal sepal directed forwards, forming a hood with the petals. Lip slightly or not at all longer than sepals, entire or shallowy trilobed, with lateral lobes often strongly reflexed; spur conical, slightly arched, downwards pointing, shorter than ovary. Flower colour is very pale to deep pink, with lateral sepals and lip finely dotted and streaked with purplish-red, the outer streaks on the lip forming an almost continuous line surrounding the other markings.

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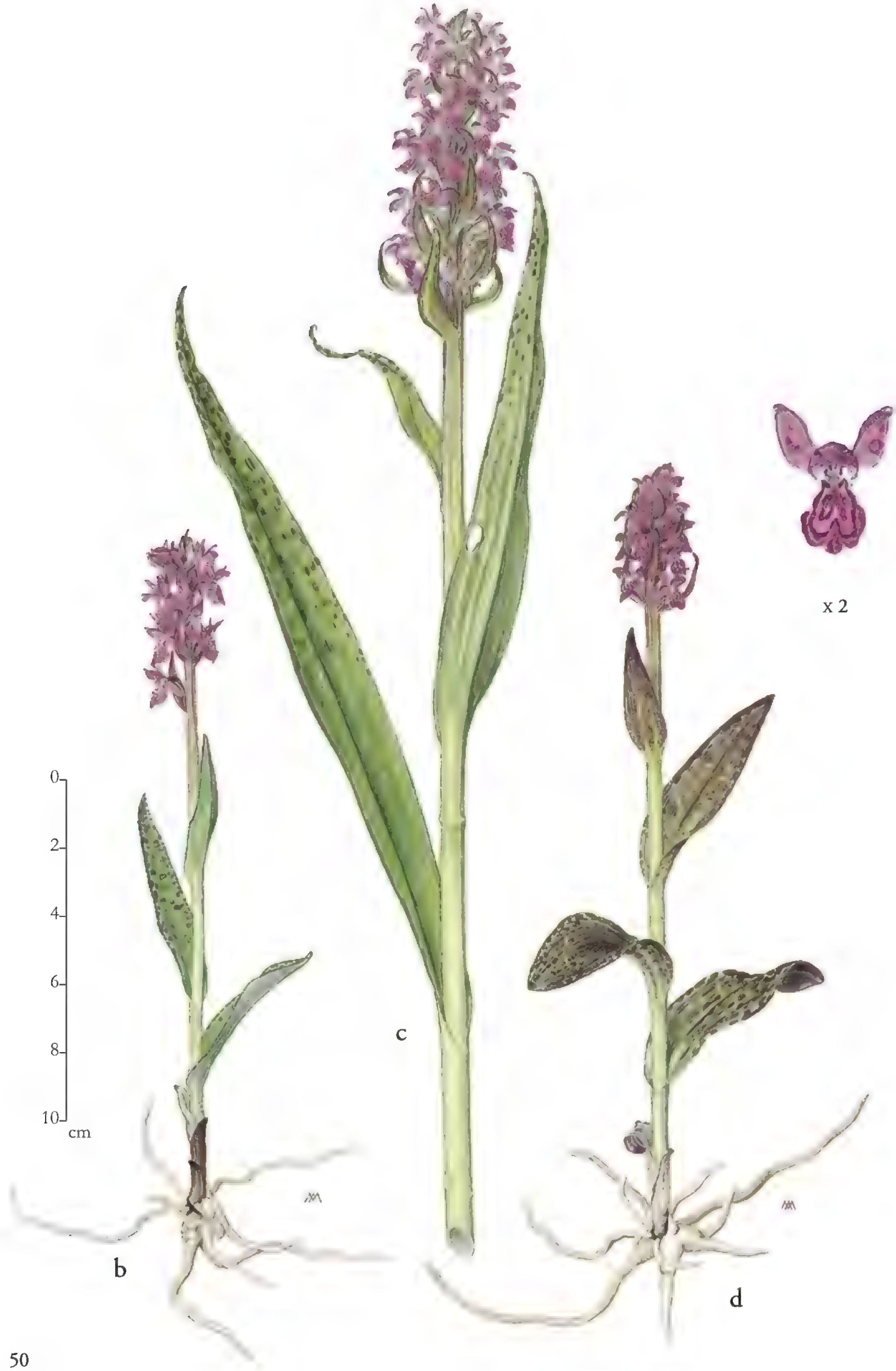
a. Tuscany (LU), Alpi Apuane, Fociomboli, m 1000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Flowering period

From May to July.

Geographical distribution

Eurasian, from Lapland to northern Greece, and from Ireland as far as China.

Habitat

Damp meadows and marshes, from 200 to 2000 m, usually on base-rich soil.

Status and conservation

It is present in northern and central Italy, and maybe in Campania too; relatively common in the Alps, becoming more uncommon towards the south.

b. Lombardy (BS), Valle del Caffaro, peat-bog near Malga Gaver, m 1500 [forma *haematodes*]; c. Trentino (TN), Carbonare di Folgaria, m 1000 [forma *hyphaematodes*]; d. Lombardy (BS), Passo del Tonale, m 1900 [forma *cruenta*].

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Dactylorhiza insularis (Sommier) Landwehr

Systematics

This is the only species in the genus *Dactylorhiza* with a triploid chromosome number (2n=60); its hybrid origin was recently demonstrated, the parental species being *D. romana* and *D. sambucina* (Bullini et al., 2001). It reproduces apomictically (Diana, 1997).

Description

Plant 20-40 cm tall. Leaves pale green, narrowly oblanceolate, up to 15 cm long, not forming a rosette, the upper ones smaller, spaced along the angled stem. Inflorescence at first dense, becoming quite lax and cylindrical in older specimens. Lower bracts longer than flowers, the others progressively shorter. Flowers uniformly yellow; lateral sepals ovate, spreading; dorsal sepal directed forwards, forming a loose hood with the slightly smaller petals. Lip more or less convex, shorter than broad, trilobed, with mid-lobe slightly smaller than the side lobes, usually bearing two or more red spots at the base; spur cylindrical, straight, almost horizontal, slightly shorter than the ovary.

Flowering period

From mid April to the end of May.

Geographical distribution

Western Mediterranean: Portugal, Spain, southern France, Corsica, Sardinia, central Italy.

Habitat

Open woodland, glades and scrubland, up to 1200 m, on dry to fairly damp, usually acidic soil.

Status and conservation

In Italy it is widespread and locally abundant in Sardinia, quite rare and local on Elba and Giglio Islands, Amiata massif, and Tosco-Emilian Apennines.

Tuscany, Isola d'Elba, M. Perone, m 550.

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Dactylorhiza maculata (Linnaeus) Soó

Systematics

In Italy four "species" of the "*maculata* group" have been reported; the binomial *D. maculata* is usually reserved for plants having flowers with a very slightly trilobed lip, mainly from the north; *D. saccifera* (Brognard) Soó and *D. gervasiana* (Todaro) H. Baumann et Künkele are names sometimes attributed to robust specimens with a rather wide spur, found principally in the centre and south; *D. fuchsii* (Druce) Soó [= *D. maculata* subsp. *meyeri* (Reichenbach fil.) Tournay] has been reported throughout the country. Within Italy the morphological differences called upon to distinguish these "species" are minimal: the plants are all relatively tall and slender, the inflorescence is usually elongate and cylindrical, the width of the spur and the length of the mid-lobe of the lip are sometimes variable even within the same population. The dimensions of the plant clearly depend on the availability of water: specimens growing in marshy habitat are always more robust than those which grow, even only a few metres away, in drier soil.

There is also kariological uniformity amongst the Italian populations, the only chromosome number established up to now being 2n=40.

It is still uncertain which name should be applied to this orchid. The present tendency is to limit the use of the specific name *maculata* to the tetraploid (2n=4x=80) plants, which are found in the northern part of the distribution area. From a morphological point of view, these are usually shorter plants with a more compact, conical inflorescence and a nearly entire lip. However, current genetic studies have revealed not only that the differences between diploid and tetraploid individuals are negligible, but also that the tetraploid populations originated from the diploids in several different localities thoughout the range, and consequently the differences between diploids and tetraploids can only be noted on a geographical basis.

In conclusion, the emerging idea is that of a single species (*Dactylorhiza maculata)* having two kariotypes (only one of which is widely represented in Italy) with morphotypes which, all things considered, do not differ greatly from each other and could be assigned the rank of varieties or at most subspecies.

Description

Plant 25-90 cm tall, with a relatively slender, solid stem, grooved above. Leaves heavily spotted on the upper surface, sub-erect or arching outwards, sheathing the stem with their basal portion, the lower ovate, the others lanceolate, becoming gradually narrower. Inflorescence usually cylindrical, elongate, many flowered, variably dense. Bracts narrowly lanceolate, acute, bordered or flushed with violet, the lower ones exceeding the

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a. Tuscany, Isola d'Elba, M. Perone, m 450; b & c. Tuscany (FI), Pratomagno, Poggio alla Risala, m 1400

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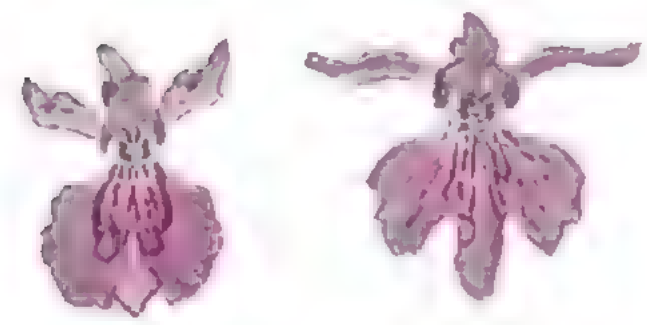

f

flowers. Flower colour variable from almost white to violet, but more frequently lilac, somewhat paler at the base of the lip, the sepals and the lip dotted and streaked with purplish-red. Sepals broadly lanceolate, their tips often curved upwards, the laterals usually spreading, the dorsal directed forwards, forming a lose hood with the petals. Lip usually flattened, broader than long, more or less deeply trilobed, with irregular margins, the mid-lobe always narrower and often longer than the side lobes. Spur cylindrical to conical, usually straight, horizontal or pointing slightly downwards, a little shorter than the ovary.

Flowering period

From May to July.

Geographical distribution

Eurasian, from Iceland to central Siberia; its range is difficult to define because of the uncertain delimitation of the species.

Habitat

Wet meadows and open woods, up to 2300 m; it is usually found on base-rich soil, but it grows equally well on acidic soil.

Status and conservation

Widespread and quite common throughout the Italian mainland, uncommon in Sicily, absent from Sardinia.

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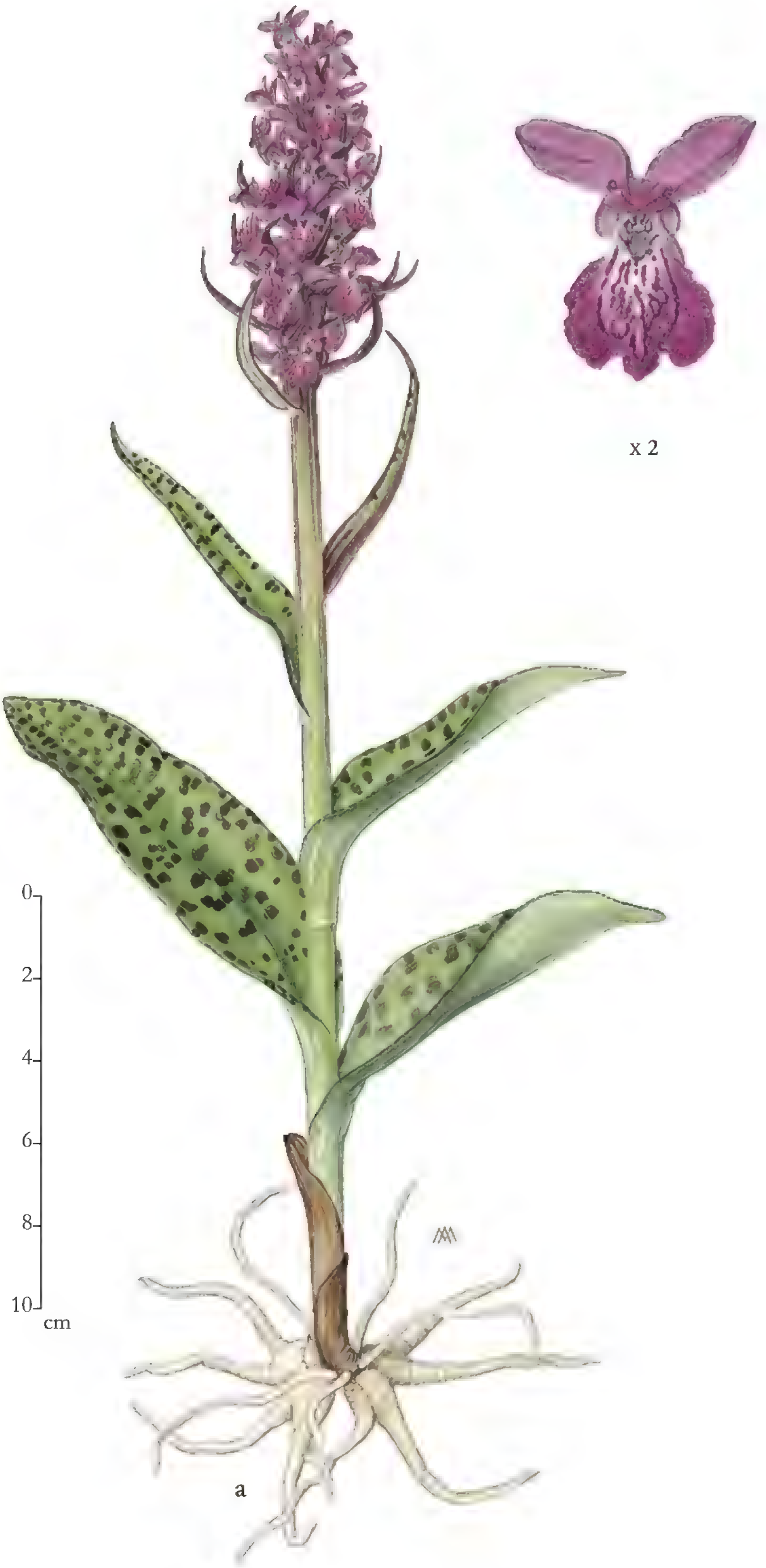
d. Tuscany, Alpi Apuane, M. Corchia, m 1400; e. Lombardy (BS), between Passo del Tonale and Ponte di Legno, m 1750; f. Molise (IS), wood near Pescopennataro, m 1250.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Dactylorhiza majalis (Reichenbach) P.F. Hunt et Summerhayes

Systematics

Synonyms: *Orchis latifolia* Linnaeus *pro parte*; *Dactylorhiza latifolia* (Linnaeus) Soó; *D. fistulosa* (Moench) H. Baumann et Künkele.

The name attributable to this orchid is still the subject of debate. The confusion is due to the fact that Linnaeus (1753) originally included three different species under the name *Orchis latifolia*. If the proposal to consider this name a *nomen confusum* (Vermeulen, 1977; Pedersen, 2000) should be accepted, the oldest available name for this orchid is *Orchis majalis* Reichenbach, 1828.

From a systematic point of view the situation is, if it is possible, even more confused. *Dactylorhiza majalis* has a chromosome number 2n=80 and originated from hybridization between *D. maculata* and *D. incarnata* followed by a doubling of the chromosomes (Hedrén, 1996; Bullini et al., 2001). The fact is that all species of the genus *Dactylorhiza* having a chromosome number 2n=80 have the same origin, with the sole exception ot the autotetraploid form of *D. maculata*, which is not reported from Italy. Therefore, they are very similar to each other genetically, also because one of the parent species, *D. incarnata*, has a very low genetic variability. In consequence, the numerous species and subspecies described in this group are also not well differentiated morphologically from each other and often tend to grade one into the other even within a single population. In spite of this the number of species described continues to grow year after year creating a true Babel of names.

In Italy, recent results of genetic investigations (Bullini et al., 2002) allow us to distinguish within this group of tetraploid orchids no more than two closely allied species: *D. elata* on one side and on the other side all the other species [*D. alpestris* (Pugsley) Averyanov; *D. lapponica* (Laestadius ex Reichenbach fil.) Soó; *D. traunsteineri* (Sauter ex Reichenbach) Soó] reported from the Alps and northern Apennines, which in this book are all grouped under the name *D. majalis*. As we have explained above, even the use of this name is controversial.

Description

Plant 15-40(60) cm tall, with a thick, hollow stem, which is angular and tinged with violet above. Leaves spaced out along the stem, sheathing, broadly lanceolate, the upper ones much narrower and bract-like, the upper surface spotted with purplish-brown, less commonly unspotted. Inflorescence dense, ovoid to cylindrical. Bracts narrowly lanceolate, acute, margined or flushed with purplish-red, usually longer than the flowers. Lateral sepals broadly lanceolate, spreading to erect; dorsal sepal directed forwards, forming a hood with the petals. Lip as long as the sepals and wider than

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a. Alto Adige (BZ), Alpe di Siusi, Trojer, m 1800

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long, trilobed to subentire, with mid-lobe much smaller and side lobes sometimes reflexed; spur conical to subcylindrical, slightly descending, shorter than ovary. Flower colour varies from pale to dark purple, with the lip and often the inner surface of lateral sepals variably dotted and streaked with a darker shade of the same colour; the base of the lip is usually much paler.

The specimens ascribed to *D. lapponica* and *D. traunsteineri* have a more lax inflorescence, composed of fewer flowers. The two are said to differ in the characters of the leaves, which are narrowly lanceolate and often unspotted in *D. traunsteineri* (fig. c), wider, shorter and always spotted in *D. lapponica* (fig. b). Specimens and entire populations with intermediate characters are very frequent and are often termed "hybrids".

Flowering period

From May to mid August.

Geographical distribution

Northern and central Europe.

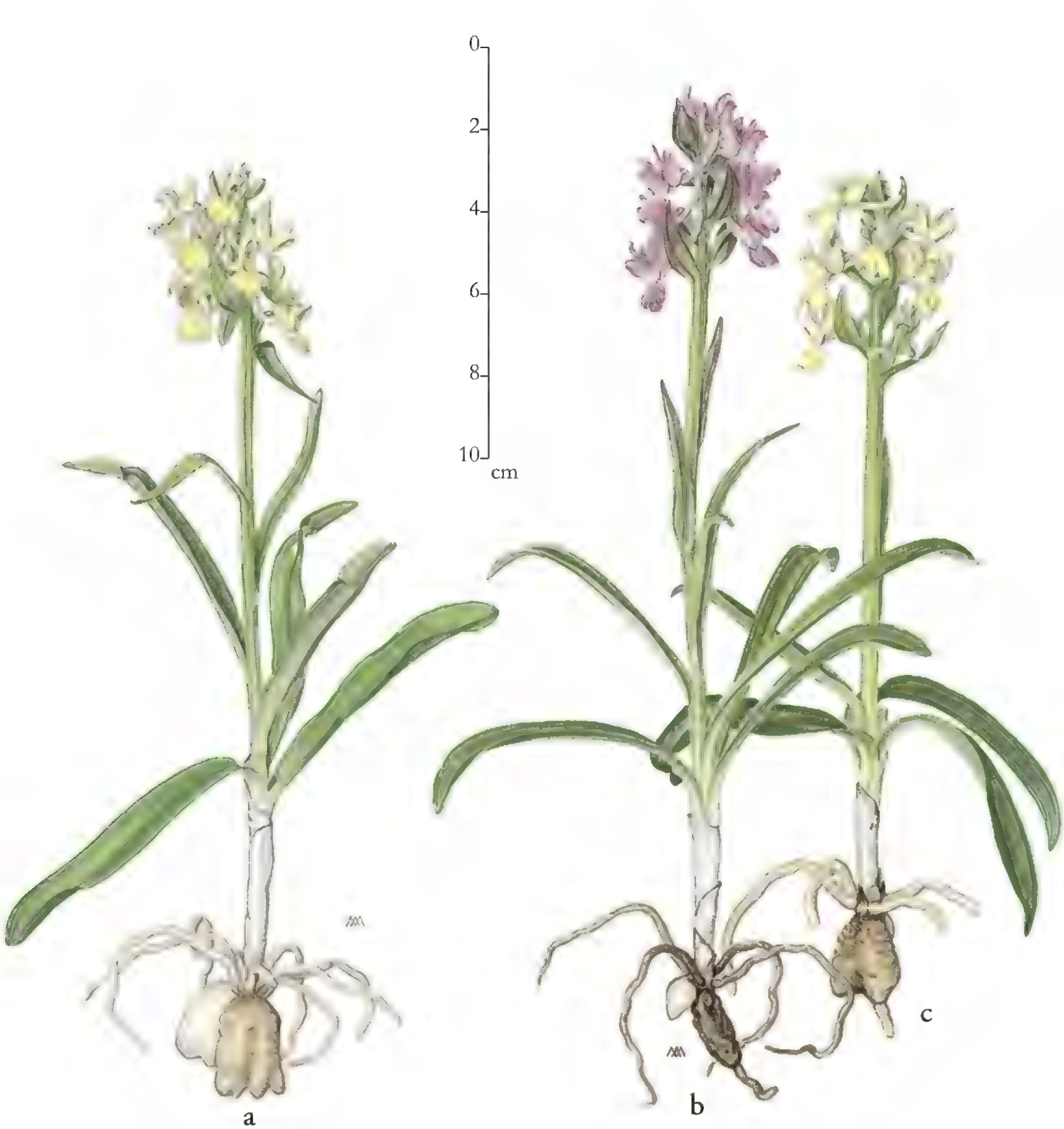
Habitat

Damp meadows, marshes, stream banks, from 300 to 2400 m, on various substrates.

Status and conservation

Common and widespread in the Alps, rare and local in the northern Apennines.

b. Trentino (TN), stream near Carbonare di Folgaria, m 1000 [forma *lapponica*]; c. Trentino (TN), swamp near Civezzano, m 800 [forma *traunsteineri*].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Dactylorhiza romana (Sebastiani) Soó

Systematics

A few populations from Sicily with a shorter spur, about as long as the ovary, and flowers always pale yellow (fig. a) have often been attributed to a distinct species or subspecies: *Dactylorhiza markusii* (Tineo) H. Baumann & Künkele = *D. romana* subsp. *markusii* (Tineo) Holub; in certain cases these orchids fall within the variability of *D. romana*, but more often they are the result of hybridization between *D. romana* and *D. sambucina*, frequently followed by introgression, crossing again with *D. romana*. The records of *D. markusii* from Sardinia are very likely misidentifications of specimens of *D. insularis* lacking the characteristic red spots at the base of the lip.

Description

Plant 15-35 cm tall. Lower leaves relatively narrow, linear-lanceolate, spreading but not forming a rosette, the upper ones gradually smaller and well spaced along the stem. Inflorescence oval and dense in young specimens, becoming more lax and subcylindrical with age. Lower bracts longer than flowers. Sepals ovate, the laterals erect, the dorsal directed forwards; petals slightly wider and shorter than sepals, forming a loose hood. Lip variably convex, sometimes folded, more or less clearly trilobed, the lobes being subequal, and the mid usually obtuse; spur slender, cylindrical, arched, longer than the ovary, pointing upwards, often truncate or bilobed at the apex. Flower colour variable: from almost white to yellow, pink and brilliant red, with all intermediate tinges. Different colours are often found together in a same population, but are sometimes found alone: for example, the yellow colour is clearly prevalent in Gargano.

Flowering period

March to May.

Geographical distribution

Mediterranean.

Habitat

Open woodland and scrub, up to 1800 m, on dry to fairly damp soil.

Status and conservation

It is unevenly distributed in central and southern Italy and in Sicily; not recorded from Molise; absent from Sardinia and northern Italy.

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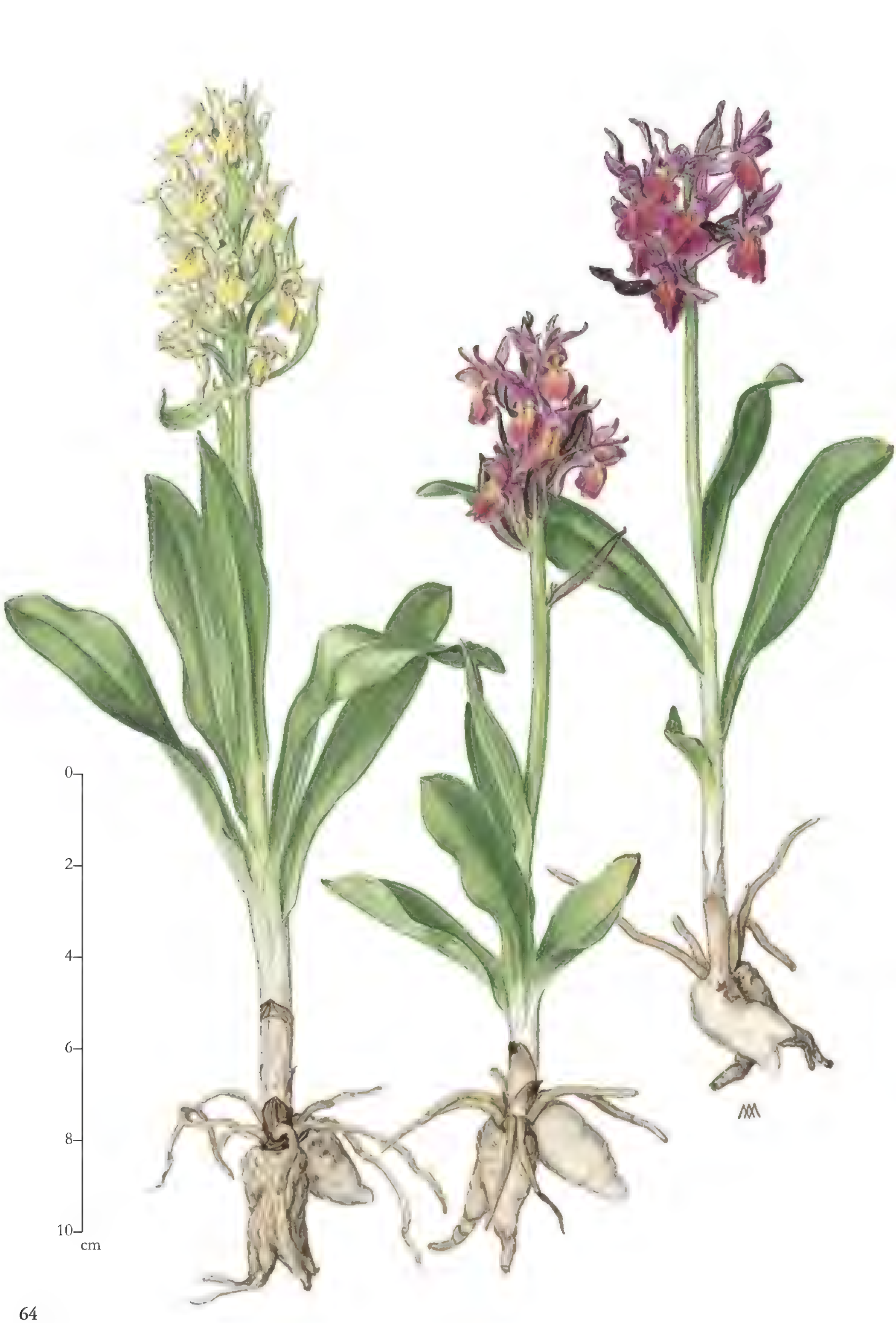
a. Sicily (PA), Madonie, between Petralia and Piano Battaglia [forma *markusii*]; b. Tuscany (GR), scrub near Sticciano, m 300; c. Tuscany (GR), M. d'Alma, near Scarlino, m 500.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Dactylorhiza sambucina (Linnaeus) Soó

Systematics

Synonyms: *Orchis latifolia* Linnaeus *pro parte*; *Dactylorhiza latifolia* (Linnaeus) H. Baumann et Künkele.

Description

Plant 20-30(40) cm tall. Leaves spaced out along the stem, the lower ones narrowly obovate with obtuse apex, the upper ones lanceolate with acute apex. Inflorescence dense, at first ovoid, than cylindrical. Bracts lanceolate, acute, longer than the ovaries, the lower ones longer than flowers. Sepals narrowly ovate, the laterals erect or almost so, the dorsal directed forward and forming a loose hood with the petals. Lip weakly trilobed or entire, more or less convex, the margins often crimped and notched; spur cylindrical to conical, about as long as the ovary, more or less curved and pointing downwards. Flower colour is yellow or magenta, with more or less evident purplish dots and streaks at the base of the lip; flowers displaying both, or intermediate colours are also found.

Flowering period

From mid April to the beginning of July.

Geographical distribution

European.

Habitat

Mountain meadows, scrub, and open woods, from 300 to 2000 m, on alkaline to slightly acidic, dry to quite damp soil.

Status and conservation

It is present in all the Italian regions with the sole exception of Sardinia.

Tuscany (FI), Pratomagno, Croce al Cardeto, m 1350.

EPIPACTIS Zinn

It is difficult to confuse this genus with any other: the underground portion of the plants consists of a rhizome, the flowers are distinctly pedunculate, sepals and petals are similar to each other in shape and size, the lip has no spur and is clearly divided in two parts, of which the basal (hypochile) is more or less hemispherical; the column is short and lacks viscidia and bursicles.

At the specific level the situation becomes much more complicated because of the large number of recently described species and subspecies, some of which are of rather doubtful taxonomic value.

The chromosome number is 2n=38, 40.

Many *Epipactis* species are self-pollinating and are characterized by either no rostellum or else a rudimentary and non functional one, and by pollen masses which disintegrate sometimes even while the flower is still in bud. The absence of a rostellum makes it possible for the pollen to reach the stigma of the same flower. Among the species described in this book the self-pollinating, or prevalently self-pollinating ones are *Epipactis flaminia*, *E. leptochila*, *E. muelleri*, *E. persica*, and *E. placentina*. *E. microphylla* can utilize both reproductive mechanisms. The cross-pollinating species attract insects by means of the nectar contained in the hypochile. Certain wasps, bees and hover flies are some of the most effective pollinators.

Key to the genus Epipactis

1	Lip longer than sepals; hypochile with erect lateral lobes	***E. palustris***
1*	Lip shorter than sepals; hypochile cup-shaped	**2**
2	Stem and ovaries densely covered with fine hairs; epichile wrinkled at the base	**3**
2*	Stem and ovaries glabrous or slightly pubescent; epichile with rough or smooth humps at the base	**4**
3	Lip whitish; leaves not longer than 3 cm, arranged spirally	***E. microphylla***
3*	Lip reddish; leaves longer than 3 cm, usually forming two rows	***E. atrorubens***
4	Flowers cross-pollinated, with rostellum present and pollen masses compact when open	**5**
4*	Flowers self-pollinating, with rostellum absent or dried out and pollen masses disintegrated when just open	**6**
5	Leaves shaded violet, especially below	***E. purpurata***
5*	Leaves green	***E. helleborine***
6	Epichile longer than wide, with clearly acute apex	***E. leptochila***
6*	Epichile wider than long, with obtuse or subacute apex	**7**
7	Leaves small, few in number (2-5), all in the upper portion of the stem; ovary slender, subfusiform	***E. persica***
7*	Leaves and ovary not as above	**8**
8	Epichile pinkish, usually flat	***E. placentina***
8*	Epichile whitish, seldom with a pinkish shade, its tip more or less arched	**9**
9	Hypochile reddish inside; ovary with pedicel shorter than 5 mm	***E. muelleri***
9*	Hypochile greenish inside; ovary with pedicel longer than 5 mm	***E. flaminia***

x 2

Epipactis atrorubens (Hoffmann ex Bernhardi) Besser

Description

Plant from 20 to 70 cm in height. Stem densely covered with fine hairs, often tinged violet in the upper portion. Leaves sheathing, keeled, arranged in two rows, sometimes suffused violet on the underside, the lower ones ovate, the others progressively more slender, the upper ones being lanceolate. Inflorescence elongate, one-sided, rather lax. Bracts acute, the lower ones longer than the whole flower, the upper ones as long as or even shorter than the ovary. Sepals ovate, usually violet with a greenish tinge, the apex acute. Petals similar to the sepals, but slightly broader. Lip somewhat shorter than other perianth segments; epichile cordate, broader than long, violet-red to purple, with fringed margins, obtuse apex, and crinkled red bosses near the base. Ovary greyish to violet, pubescent.

Flowering period

From the end of June to the end of August.

Geographical distribution

European-Caucasian, not frequent in the Mediterranean area or in the Caucasus.

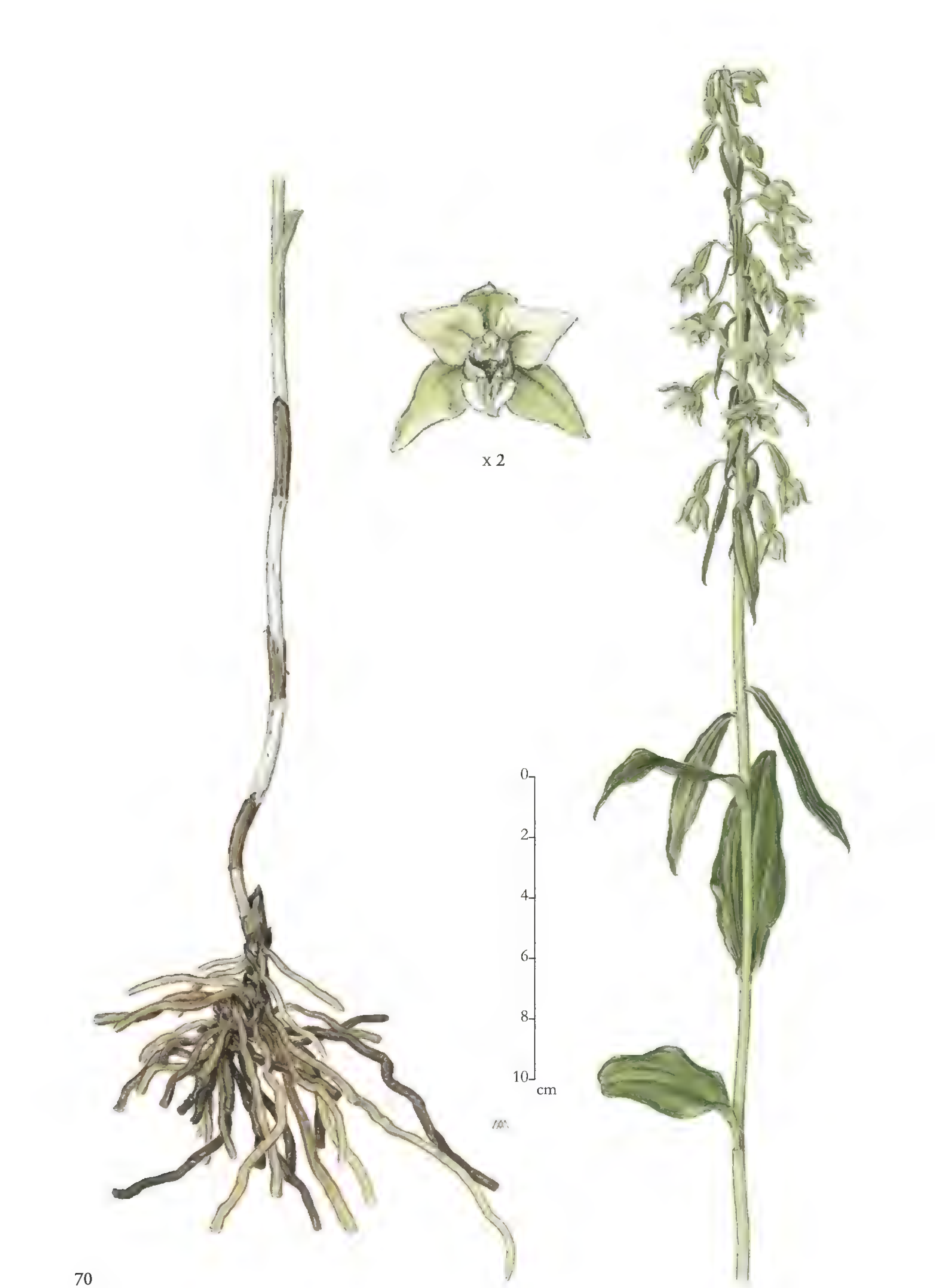
Habitat

Open woodland, mountainous dry grassland, and screes, from 150 m (in the North only) to 2300 m, on calcareous soil, more rarely on acidic soil.

Status and conservation

Although reported from all the regions of the Peninsula except Apulia, this species is progressively less common as you go southwards; in southern Italy it is definitely rare and very local in the mountain areas; absent from the islands.

Alto Adige (BZ), Val Gardena, between S. Pietro and Ortisei, m 1230.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Epipactis flaminia P.R. Savelli et Alessandrini

Systematics

This recently described species (Savelli & Alessandrini, 1994) is very closely related to *Epipactis greuteri* H. Baumann et Künkele, from which it differs by the column lacking a rostellum.

Description

Plant 35-80 cm tall. Stem green, with the upper portion covered with a dense pubescence. Lower leaf ovate, inserted at some distance from the ground, the others narrowly elliptic, widely spaced. Inflorescence elongate, variably dense, composed of hanging, campanulate flowers. Bracts narrowly lanceolate, the lower ones much longer than the flowers, the others progressively smaller. Sepals and petals narrowly ovate, pale green. Lip shorter than sepals; hypochile hemispherical, whitish shaded green outside, olivaceous inside; epichile slightly broader than long, heart-shaped, whitish, with two small humps tinged pale green at its base. Ovary pubescent, distinctly angled, with a relatively long, arched or sigmoid stalk.

Flowering period

August.

Distribution

Central Italy.

Habitat

Mixed beech and silver fir woodland, between 800 and 1200 m, on calcareous soil.

Status and conservation

To date, this species has only been found in the northern Apennines, in Romagna and in a neighbouring locality in Tuscany.

Emilia Romagna (FO), Campigna Forest, m 1200.

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Epipactis helleborine (Linnaeus) Crantz

Systematics

This species is very variable in habit, size, and flower colour. As a consequence several subspecies or closely allied "species" of more or less uncertain taxonomic value have been described.

Description

Plant 20-100 cm tall. Leaves arranged in a spiral, clasping the stem, usually horizontal, the lower roundish, the upper sometimes quite long, oblong-lanceolate. Inflorescence elongate, more or less dense, one-sided, composed of many flowers carried horizontally or slightly pendant. Bracts green, lanceolate, the lower ones longer than flowers, the others progressively smaller. Sepals spreading, ovate, greenish, variably tinged with pink. Petals slightly broader than sepals, more frequently pinkish tending to green towards the base, but sometimes whitish, greenish or purplish. Lip hypochile hemispherical, greenish tinged with pink outside, purplish-brown inside; epichile heart-shaped, with two rough humps at its base, the tip usually curving backwards. The colour of the lip is variable: whitish, pale-green, pinkish, or purplish-red.

Flowering period

From June to the end of August; from the end of April on the islands only.

Geographical distribution

Eurasian, from Ireland to Siberia; also present in North Africa (Morocco, Algeria and Tunisia); it was introduced accidentally into North America, where it is now widespread.

Habitat

Broad-leaved and mixed woodland, dense or quite open, woodland margins and clearings, scrubland, up to 2000 m, on both calcareous and slightly acidic, usually deep and relatively damp soil.

Status and conservation

Widespread and relatively common throughout the country, especially in the highlands.

Tuscany (PO), Migliano, m 700.

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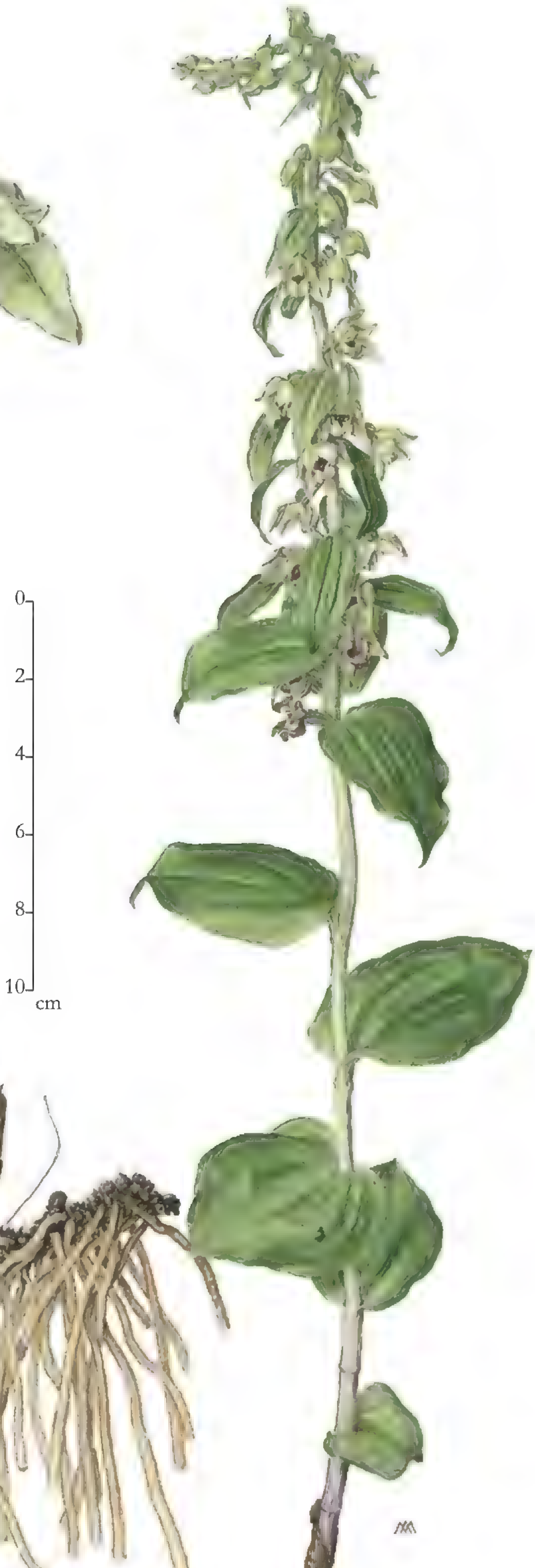


Epipactis helleborine (Linnaeus) Crantz subsp. **tremolsii** (Pau) E. Klein

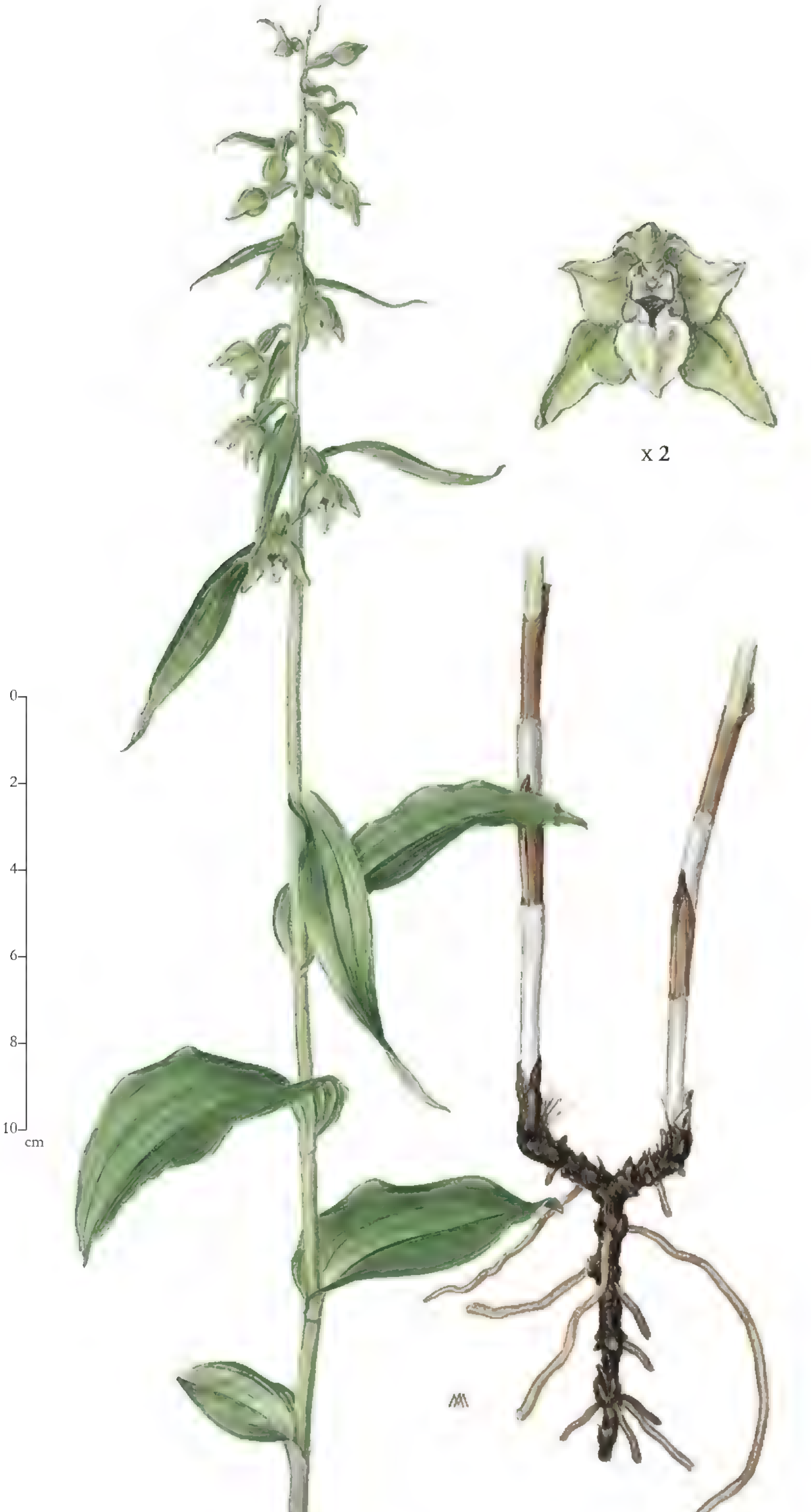
Systematics

Epipactis helleborine subsp. *tremolsii* belongs to a group of subspecies (considered by some to be "good" species) of *E. helleborine* which have adapted to a sunny, dry environment. These subspecies have in common rounder, more leathery leaves with more undulating margins and a more robust stem than the typical specimens of *E. helleborine*. They also have a very long inflorescence, frequently longer than half the height of the whole plant, often very dense and with very long lower bracts. In Italy three of these subspecies have been reported: *E. h.* subsp. *orbicularis* (Richter) E. Klein (= *E. distans* Arvet-Touvet), *E. h. subsp. tremolsii* and *E. h.* subsp. *latina* W. Rossi et E. Klein. The border lines between these three entities are not always clear, to the extent that they have often been confused with each other. To further confuse the issue, sometimes a single population presents individual plants which, taken singly, could be attributed to different subspecies (Tyteca, 1995); at times these populations are in close contact with populations of *E. helleborine* subsp. *helleborine* and with specimens which show intermediate characteristics (Giotta & Piccitto, 1993).

The distinctive characters lie in the shape and placement of the leaves (Klein, 1997): in subsp. *latina* they are leathery, relatively large and all massed together at the base of the stem, so that between them and the inflorescence there is always an "empty" space; in subsp. *orbicularis* the leaves are smaller, less leathery, widely spaced and regularly distributed along the stem; subsp. *tremolsii* has intermediate characteristics between the other two (although they are closer to those of subsp. *latina*), with more leathery and larger leaves than those of subsp. *orbicularis*, but as in the latter they are distributed along the whole stem. It is very likely that these differences are linked to the habitats occupied by the plants. Subsp. *orbicularis* is reported only from mountain localities (therefore relatively cool) between 400 and 1500 m in altitude in Trentino, Lombardy, Friuli and Emilia Romagna. Subsp. *latina* seems the best adapted to the more xeric environments and can be found even on the driest and sunniest calcareous screes (as the name indicates it was described on populations from Latium); the specimens illustrated by Baumann & Baumann (1988), by Delforge (1994) and by De Martino et al. (2000) do not belong to this subspecies and resemble more closely the subsp. *orbicularis*. Also from an ecological point of view subsp. tremolsii occupies an intermediate position, growing in habitats similar to those of the subsp. *latina*, but less extreme; it is reported from Sardinia, Tuscany and Emilia Romagna. It is superfluous to point out that the distribution data for these three entities are completely provisional.

A question that remains to be solved is the following: have the plants in question evolved to survive in xeric environments, and therefore their characters have a taxonomic value, or does each specimen of *Epipactis helleborine* have a certain morphological plasticity which permits it to adapt itself to the environment in which it happens to be growing? Only thorough and precisely aimed research can provide the answer.

Sardinia (CA), Domusnovas.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Epipactis leptochila (Godfery) Godfery subsp. **neglecta** Kumpel

Systematics

Several authors agree in stating that *E. leptochila* is a very variable orchid (Claessens & Kleynen, 1999; Gévaudan, 1999). The presence in our country of its typical form (subsp. *leptochila*) is not confirmed: most of the Italian populations have been ascribed to subsp. neglecta because of the presence in the just opened flowers of a small rostellum, which dries out losing any function in a very short time, and for the tip of the lip which curves downwards, often asymmetrically, in older flowers.

As one can easily see, the taxonomic position of Italian populations attributed to *E. leptochila* and related species is anything but settled.

Description

Plant 20-60 cm tall. Stem slender, pubescent in the upper portion. Leaves usually arranged in two rows, the lower ones ovate, the upper lanceolate, their margins often undulate. Inflorescence lax, composed of campanulate and often hanging flowers. Bracts narrowly lanceolate, the lower much longer than the flowers, the others progressively smaller. Sepals green, narrowly ovate, acute at the apex. Petals similar to the sepals, pale green, sometimes tinged with pink. Lip hypochile cup-shaped, greenish outside, dark reddish brown inside; epichile triangular, clearly longer than broad, usually flat, the acute apex sometimes curving downwards asymmetrically in older flowers, whitish or pale green, sometimes tinged with pink in the middle, with two small humps at the base. Ovary fusiform and pubescent.

Flowering period

July and August.

Geographical distribution

European, from Belgium to Slovakia.

Habitat

Broad-leaved woodland, between 800 and 1600 m, on calcareous soil.

Status and conservation

This orchid has only recently been reported in Italy, therefore its distribution and its frequency in our country are not yet well defined.

Trentino (TN), Madonna di Campiglio, along the path of Vallesinella, m 1550.

x 2

Epipactis microphylla (Ehrhardt) Swartz

Description

Slender plant, ranging from 15 to 45 cm in height. Stem pubescent. Leaves small, rarely exceeding 3 cm in length, widely spaced, the lower ones broadly elliptic, the upper ones lanceolate, progressively narrower. Inflorescence lax, elongate, often one-sided, composed of relatively small, campanulate, hanging flowers. Bracts narrow, lanceolate, acute, the lower ones exceeding the flowers, diminishing in length higher up. Sepals slightly concave, ovate, acute at the apex, greenish inside, greyish more or less tinged with purple, and pubescent outside. Petals similar to, but slightly broader than sepals, pale green, sometimes tinged pink. Lip shorter than sepals; epichile heart-shaped, whitish to pale green, sometimes tinged pink, with irregular margins, the apex usually curving downwards, and a crinkled whitish boss at the base extending forwards, broadly forming a Y. Ovary villose, pyriform, clearly stalked.

Flowering period

May to the beginning of August.

Geographical distribution

European-Caucasian, from Belgium to northern Iran.

Habitat

Broad-leaved woodland, rarely in coniferous woodland, woodland margins and scrubland, up to 1800 m, on calcareous soil.

Status and conservation

Reported from all the Italian regions except the Val d'Aosta, but progressively less common moving northwards.

Tuscany (FI), Pratolino, pine-wood along the road to M. Morello, m 530.

x 2

Epipactis muelleri Godfery

Description

Plant 20-60(70) cm tall. Stem greenish, pubescent in the upper portion. Leaves broadly lanceolate, often with undulate margins, sometimes arranged in two rows. Inflorescence elongate, sometimes one-sided, more or less dense, composed of hanging, campanulate flowers. Bracts narrowly lanceolate, the lower ones longer than the flowers, the others progressively smaller. Sepals and petals narrowly ovate, pale green, sometimes tending to yellow. Lip shorter than other perianth segments; hypochile hemispherical, greenish-white, sometimes shaded pink outside, brownish-red inside; epichile rather small, heart-shaped, whitish or very pale green, with two small, smooth humps at its base usually tinged pink. Ovary pyriform, shortly stalked.

Epipactis muelleri subsp. *cerritae* Grasso has a more slender habit and flowers with the lip coloured purplish-pink.

Flowering period

From mid June to mid August.

Geographical distribution

Central and southern Europe, from Holland to central Italy, and from Spain to Hungary; subsp. *cerritae* is reported only from eastern Sicily.

Habitat

Open woodland, woodland edges, glades, and scrub, up to 1500 m, on fairly dry, calcareous soil.

Status and conservation

This species is widespread throughout Italy, although quite rare in the south; it has never been reported so far in Val d'Aosta or Umbria; records from Calabria need confirmation.

Tuscany (FI), Pratolino, pine-wood along the road to M. Morello, m 530.

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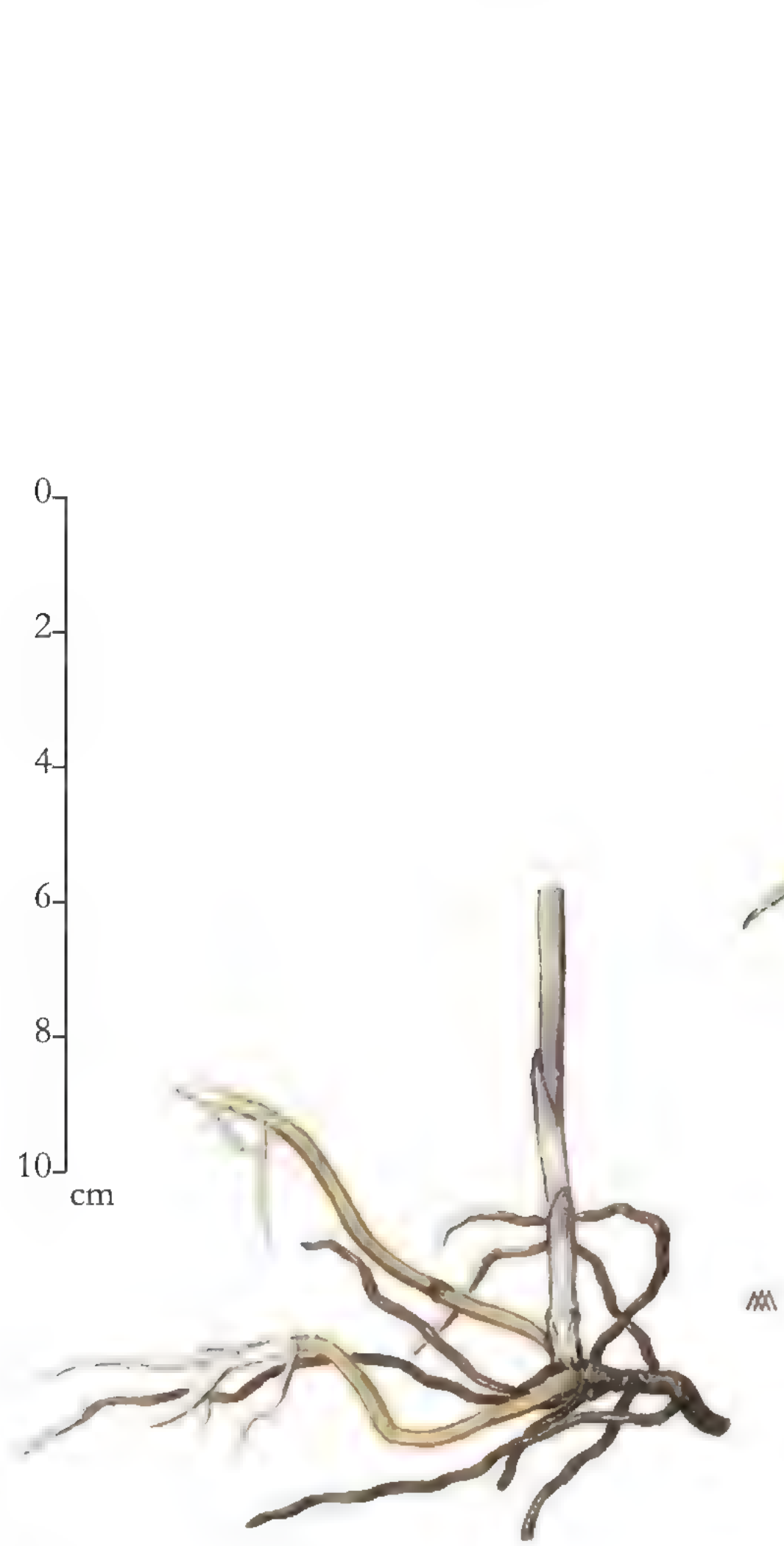

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Epipactis palustris (Linnaeus) Crantz

Description

Plant from 20 to 60 cm in height. Stem pubescent and often darker in the upper portion. Leaves sheathing, keeled, sometimes purplish on the underside, the lower ones oblong-lanceolate, acute, the others progressively smaller. Inflorescence loose, one-sided. Bracts acute, the lowest equalling the flower, the upper ones as long as or even shorter than the ovary. Flowers at first horizontal, than pendant. Sepals lanceolate, pubescent, greyish, and tinged with green or pink outside, reddish inside. Petals shorter and narrower than sepals, obtuse, whitish, tinged pink at the base. Lip longer than sepals; hypochile slightly concave, greyish striped with red inside, with erect, triangular side lobes; epichile joined to the hypochile by a narrow hinge, whitish, rounded, with wavy margins, and a pinkish or yellowish toothed boss margined orange yellow at the base. Ovary stalked, fusiform, pubescent.

Flowering period

From June to August.

Geographical distribution

Eurasian; quite uncommon both in the northernmost and southernmost areas of Europe.

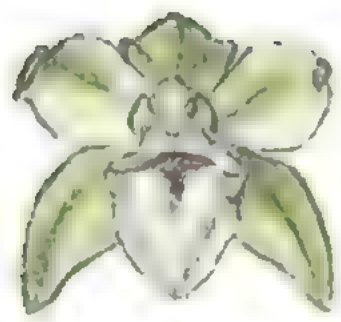
Habitat

Marshes, fens, margins of streams, very damp meadows, up to 1600 m, on alkaline or neutral soil.

Status and conservation

Reported from all the Italian regions, but very rare in southern Italy and on the islands.

Tuscany (LU), Viareggio, Macchia Lucchese.



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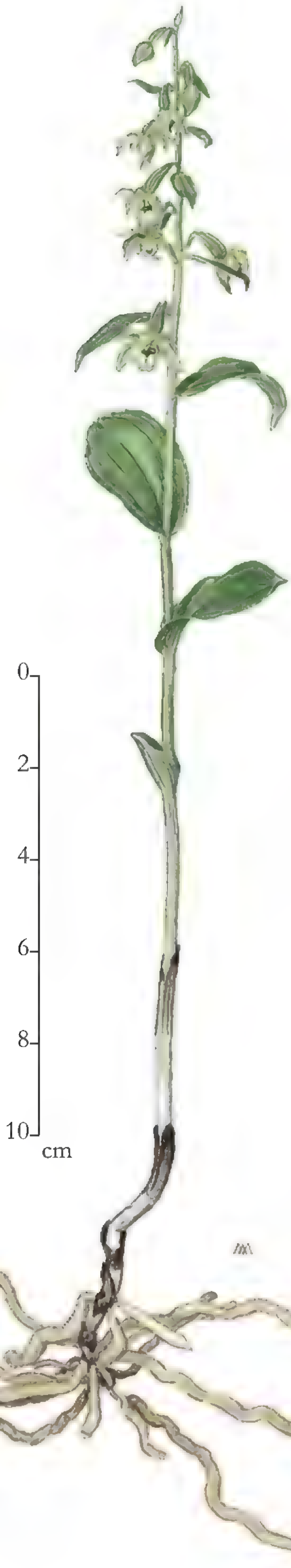

Epipactis persica (Soó) Nannfeldt subsp. **gracilis** W. Rossi

Habitat

Mature beech woodland, between 800 and 1600 m, on calcareous soil.

Status and conservation

Recorded from most of the regions of southern and central Italy (Calabria, Campania, Latium, Abruzzo, Marche, Tuscany, Emilia Romagna), and in Sardinia.

Description

Slender plant 15-45 cm tall. Stem quite slender, pubescent in the upper portion. Leaves 2-4, all in the upper half of the stem, bordered with hyaline papillae, the lower one elliptic, the upper lanceolate. Inflorescence lax, one sided, composed of 3-15(19) relatively small, campanulate, hanging flowers. Bracts narrowly lanceolate, the lower longer than the flower, the others progressively smaller. Sepals green, narrowly ovate. Petals slightly shorter, broader, and paler than sepals. Lip shorter than sepals; hypochile cup-shaped, green outside, reddish brown inside; epichile triangular, very pale green, with two slightly wrinkled, whitish or pinkish humps at the base. Ovary slender, shortly stalked.

Flowering period

Between the end of July and the end of August.

Geographical distribution

South-Eastern Europe, from Sardinia to Bulgaria and from Hungary to Greece.

Tuscany (SI), M. Amiata, near Abbadia S. Salvatore, m 1100.

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Epipactis placentina Bongiorni et Grünanger

Habitat

Open mixed woodland, from 750 to 1100 m, on slightly acidic soil.

Status and conservation

Because of its recent description (Bongiorni & Grünanger, 1993), the distribution of this orchid is not well known. It has been reported so far in Emilia Romagna, Tuscany, Marche, Latium, Campania, and Calabria.

Systematics

To date, the systematic position of this orchid is not clearly defined. It is very similar to *Epipactis muelleri* Godfery, from which it differs mainly in the pinkish colour of its flowers, and to *E. muelleri* subsp. *cerritae* Grasso, which has a more slender habit and flowers coloured purplish pink.

Description

Similar to *Epipactis muelleri*. The flowers have petals and sepals greenish, more or less tinged with pink, and a pinkish lip, which is purplish inside the hypochile; moreover, the epichile is almost flattened or with the margins curving upwards.

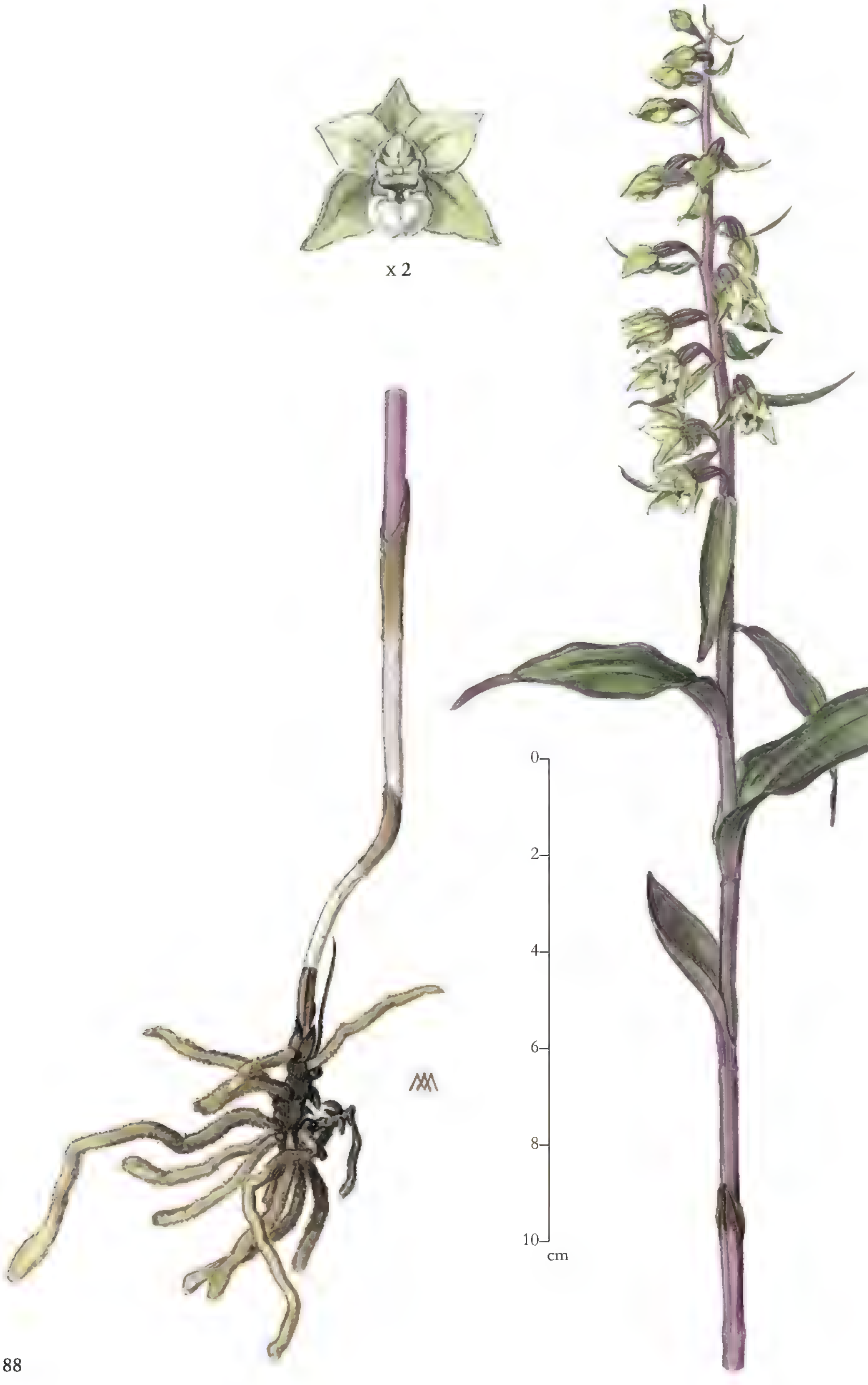
Flowering period

From mid July to mid August.

Geographical distribution

Italy, eastern France and Slovakia.

Emilia Romagna (PC), Ferriere, M. Ragola, m 1400.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Epipactis purpurata J.E. Smith

Systematics

The conspecifity between *E. purpurata* and *E. viridiflora* Hoffman ex Krocker has been suggested (Baumann & Künkele, 1999); if this is confirmed, the latter name has priority.

More recently the new species *E. pollinensis* B. et H. Baumann was described from Mt. Pollino, which differs from *E. purpurata* in being smaller in all its parts (B. & H. Baumann, 2000).

Description

Plant up to 60 cm tall. Stem violaceous, pubescent in the upper portion. Leaves arranged in a spiral, relatively small, lanceolate, dark green tinged with purple, especially on the underside. Inflorescence elongate, usually dense and one-sided. Bracts quite large, lanceolate, the lower ones much longer than flowers, the others progressively smaller. Sepals spreading, narrowly ovate, keeled, pale green inside, pubescent, greenish, and sometimes tinged with purple outside. Petals slightly smaller than sepals, pale green, sometimes tinged pink.

Lip shorter than sepals; hypochile hemispherical, greenish tinged pink outside, violaceous inside; epichile whitish, heart-shaped, with two lilac or pale brown humps at its base. Ovary stalked, pyriform, distinctly angled.

Flowering period

From the beginning of August to the end of September.

Geographical distribution

Central and western Europe, from southern England to the Moldavian Republic, and from Denmark to southern Italy.

Habitat

Shady woodland, from 1000 to 1400 m, on deep, cool soil.

Status and conservation

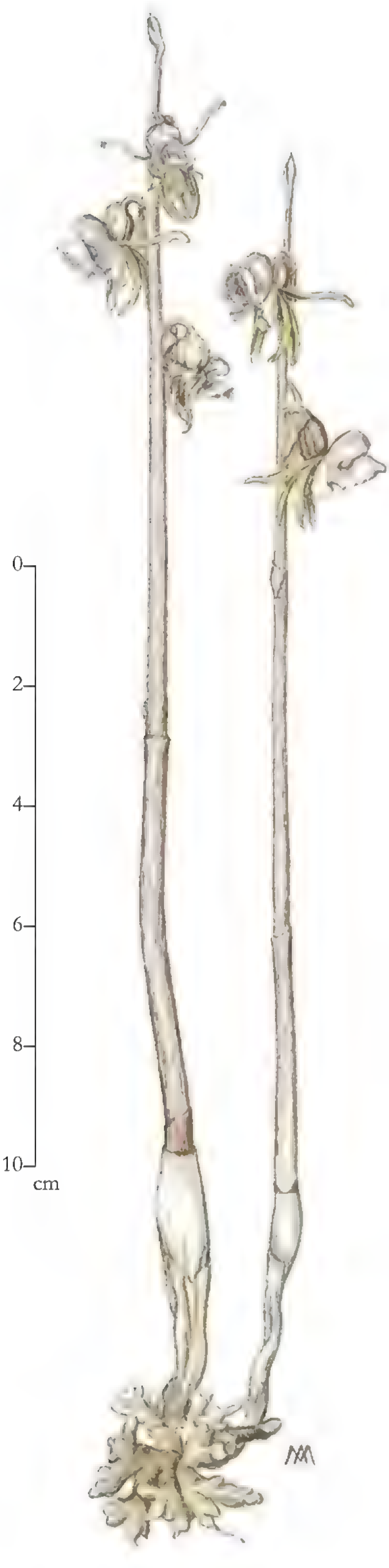
Quite rare in Italy, reported only from Lombardy, Emilia Romagna, Tuscany, Marche, Abruzzo, and Calabria.

Emilia Romagna (FO), Campigna Forest, m 1200.

EPIPOGIUM J.G. Gmelin ex Borckhausen

Only one species of this genus is present in Italy and in Europe; a second species is widespread in the Palaeotropics. It is characterized by an enlarged rhizome which gives rise to stems lacking leaves and chlorophyll. The peduncled flowers have a spur and an upward pointing lip, which is larger than the other flower parts. The column is short with two pollinia, each having a short caudicle and its own viscidium.

The chromosome number has never been counted on Italian specimens, but from elsewhere in Europe it is 2n=68.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Epipogium aphyllum Swartz

Description

This species is characterized by a coral-like rhizome, by the absence of chlorophyll and true leaves, and by the lip directed upwards. Stems are yellowish to reddish, 10-20 cm tall, with the lower portion sheathed by 1-3 reduced, membranaceous, bract-like leaves. Inflorescence very lax, 2-8 flowered. Bracts oval, longer than ovary, membranaceous. Sepals and petals narrowly lanceolate with obtuse apex, yellowish to pink, translucent, pendent or slightly divergent, more or less twisted. Lip pointing upwards and forwards, trilobed, with small, rounded, yellowish side lobes, whilst the mid-lobe is large, broadly heart-shaped, concave, translucent, whitish, often shaded with purple, bordered on each side with 2-3 irregular, longitudinal ridges surmounted by large, lilac papillae; spur sacciform and slightly bent forwards. The pendent, translucent flower reminds one of a tiny jellyfish.

Flowering period

From the end of June to mid September.

Geographical distribution

Eurosiberian. It is found throughout Europe, with the exception of the warmest areas, reaching Japan to the East; quite uncommon everywhere.

Habitat

Mature mountain woodland rich with leaf mould, from 700 to 2000 m.

Status and conservation

In Italy it is a rare species, although reported in all the regions of the mainland except Apulia, Umbria, Liguria, and Val d'Aosta; absent from the islands (Perazza et al., 1999). This orchid is not easy to find not only because of its rarity, but also for its very irregular and unpredictable flowering.

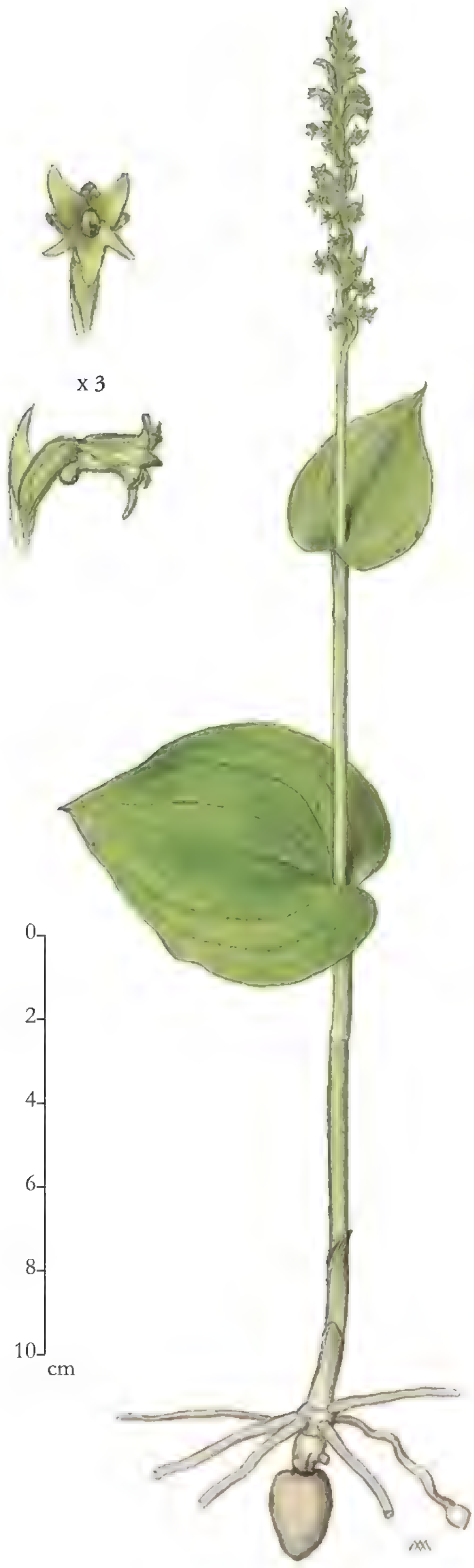
Emilia Romagna (PR), Lagdei, m 1400.

GENNARIA Parlatore

Gennaria is a monospecific genus. It is similar to *Herminium* in its general appearance and in having a single subglobose tuber during its flowering period, but it differs from it in that the flowers have a spur and the pollinia lack caudicles.

The chromosome number is 2n=34(40).

Nothing is known about pollination in *Gennaria diphylla*. The species certainly propagates itself also by producing new tubers at the tip of long runners.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Gennaria diphylla (Link) Parlatore

Habitat

Shady places in scrubby thickets and pinewoods, up to 400 m, mostly on acidic soil.

Status and conservation

In Italy it is restricted to a few localities in northern Sardinia (Gallura) and the Arcipelago della Maddalena. In most of these localities, not far from the sea, the populations are being reduced by progressive property development along the coast.

Description

Plant entirely green, slender, from 15 to 30 cm in height. Leaves 2 only, alternate, well spaced, clasping, heart-shaped with acute apex, the upper smaller than the lower. Inflorescence elongate, one-sided, rather dense, composed of 10-30 small, yellowish-green flowers. Bracts acute, longer than the ovary. Sepals oblong, obtuse, directed forwards. Petals longer and broader than sepals, with the obtuse apex curved upwards. Lip trilobed, the median lobe being triangular with the obtuse apex curved downwards, and lateral lobes much shorter and more slender; spur pouched, less than 2 mm long.

Flowering period

From the end of February to the end of April.

Geographical distribution

Mediterranean-Atlantic, from Sardinia and Corsica to the Balearic Islands, southern Spain, Portugal, Tunisia, Algeria, Morocco, Madeira, and the Canary Islands.

Sardinia (SS), Stintino.

GOODYERA R. Brown

This genus is similar to *Spiranthes*, from which it differs mainly in its underground portion, having horizontal rhizomes instead of tuberous roots. The only species of this genus which is found in Italy, i. e. *Goodyera repens*, is also the only one of our orchids to have creeping stolons and leaves with obvious reticulate veining.

The chromosome number is 2n=30.

The flowers of *G. repens* are often visited by bumblebees and other Hymenopterans, among which those of the genus *Lasioglossum* are the most efficient pollinators. The long creeping stolons play an important role in the propagation of this species, as they produce new plants at their tips.

x 3

Goodyera repens (Linnaeus) R. Brown

Habitat

Coniferous shady woodland, especially where the ground is covered by heathers and mosses, between 400 and 2000 m.

Status and conservation

It is naturally present in all the regions of northern Italy, but through reafforestation it has been introduced accidentally in the northern Apennines and in the Apuan Alps.

Description

Slender plant 10-25 cm tall. Lower leaves arranged in a spreading, flattened rosette, ovate, acute, dark green with a paler network of veins. Stem pale green, pubescent in the upper portion. Inflorescence elongate, rather dense, unilateral or somewhat spiral, composed of 5-20 small, white flowers. Bracts narrow and acute, slightly longer than the ovary. Sepals covered with glanduar hairs on the outside, ovate, the laterals spreading, more or less, the dorsal directed forwards. Petals slightly narrower, forming a tight hood with the dorsal sepal. Lip slightly shorter than sepals, strongly concave at the base, triangular and curving downwards at the apex.

Flowering period

July and August.

Geographical distribution

Circumboreal.

Alto Adige (BZ), Val Gardena, fir-wood between S. Pietro and Ortisei, m 1230.

GYMNADENIA R. Brown

In this genus the flowers are characterized by a long and slender spur, short column, elongate rostellum, distinct and elongate viscidia without bursicles. The underground portion bears flattened tubers which are palmately lobed for about half of their length.

The chromosome number is 2n=40.

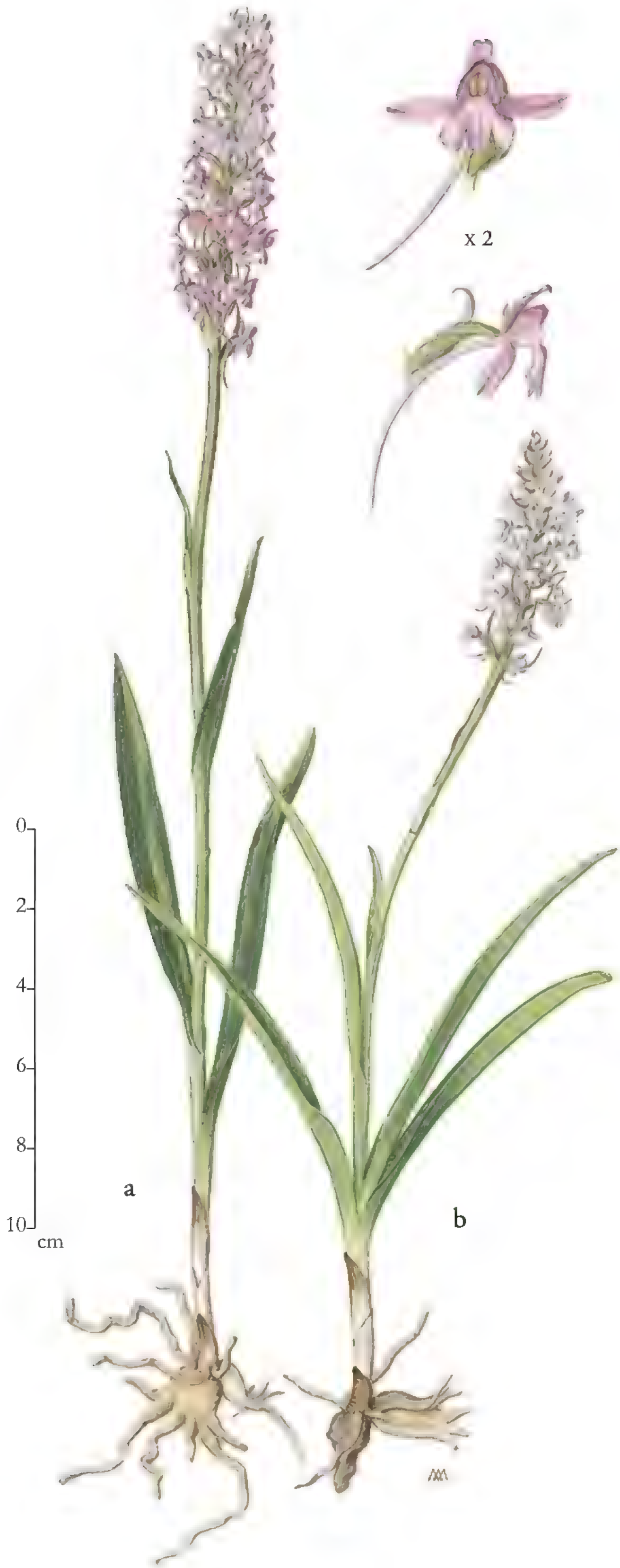
This genus is closely allied to *Nigritella*, as can be deduced from the frequent hybrids and has been confirmed by studies based on molecular markers (Bateman et al., 1997). The *Nigritella* species, however, form a natural group which can be kept distinct at least at a subgeneric level. They differ from the species of *Gymnadenia sensu* stricto in having a very short spur, lip pointing upwards and small, not elongated viscidia.

The abundant nectar produced in the long, narrow spur of the two Italian species of *Gymnadenia* can be reached only by the slender proboscis of butterflies and moths, which are the only pollinators of these orchids.

Key to the genus Gymnadenia

1 Spur much longer than the ovary ..... ***G. conopsea***

1* Spur about as long as the ovary ..... ***G. odoratissima***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Gymnadenia conopsea (Linnaeus) R. Brown

Systematics

Several subspecies and varieties have been suggested for this orchid. Further studies are needed to find out whether or not the morphological differences which are found in plants inhabiting different biotopes have a genetic base, and therefore taxonomical value.

It is easily seen that plants growing upon dry substrates are smaller, have a more dense inflorescence, and paler flowers which open earlier compared to the plants growing in damp biotopes.

Description

Plant 20-70 cm tall. Lower leaves keeled, narrowly lanceolate, acute, sub-erect, the upper ones progressively smaller and bract-like. Inflorescence elongate, at first conical and then cylindrical, variably dense, composed of many relatively small flowers. Bracts sometimes tinged violet, lanceolate, narrow, acute, about as long as the ovary. Sepals oblong, obtuse at the apex, the lateral ones spreading horizontally, the dorsal curving forward to form a loose hood with the petals, which are slightly broader and shorter. Lip somewhat wider than long, deeply trilobed, with lobes almost equal; spur very slender, about twice as long as the ovary, curved downwards. Flower colour is uniformly pinkish lilac to violet, less commonly whitish.

Flowering period

From the end of May to the beginning of August.

Geographical distribution

Eurasian. Widespread thoughout Europe, although less common in the south, extending eastward to China.

Habitat

Grassland, mountain pastures, marshes, up to 2600 m, on dry to very damp, preferably calcareous soil.

Status and conservationf

Widespread throughout the mainland, absent from Sardinia and Sicily.

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a. Tuscany, Appennino Lucchese, M. Prato Fiorito, m 1200; b. Lombardy (BS), Val Camonica, near Bazena, m 2000.

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Gymnadenia odoratissima (Linnaeus) L.C.M. Richard

Habitat

Grassland, mountain pastures, open pine woods, and screes, from 300 to 2400 m, on very dry to damp, calcareous soil.

Status and conservation

Recorded from all the regions of northern Italy except Liguria, and also from the Apuan Alps (northern Tuscany).

Description

Plant 15-30(40) cm tall, similar to *G. conopsea*, but smaller and slenderer. Lower leaves linear, channelled, sub-erect or arched, the upper ones progressively smaller and bract-like. Inflorescence ovoid to cylindrical, quite dense, usually looser below, composed of many small flowers very similar in shape to those of *G. conopsea*. Bracts lanceolate, very narrow, acute, the lower ones longer than flowers. Lip longer than wide, trilobed, with the mid-lobe much longer than the side ones; spur very slender, equalling the ovary in length, curved downwards. Flower colour is paler than in *G. conopsea*, ranging from pink to white.

Flowering period

From the end of May to August.

Geographical distributionf

European, from southern Sweden to Greece, and from northern Spain to Russia.

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a. Friuli (UD), between Forca di Zouf di Fau and Rifugio Grauzaria, m 1650; b. Tuscany, Alpi Apuane, slope SW of Pania della Croce, m 1000.

HAMMARBYA Kuntze

A monospecific genus very close to *Malaxis*, from which it differs in characters of little importance such as the younger pseudobulb situated above the ground, the lip much shorter than the sepals and the presence of bulbils on the leaf margins.

The chromosome number is 2n=28.

The tiny flowers, which have no spur, produce a small amount of nectar at the base of the lip and are pollinated by very small insects, usually flies.

Hammarbya paludosa has a characteristic which is unique among European orchids. It propagates itself also vegetatively by producing tiny bulbils on the leaf margins. When these bulbils detach themselves from the mother plant and fall to the ground they are rapidly infected by the symbiotic fungi and grow into new plants.

x 3

Hammarbya paludosa (Linnaeus) Kuntze

Description

Tiny plant up to 12 cm tall, entirely greenish yellow. Leaves 3-4, the largest not exceeding 3 cm in length, elliptic to ovate, sheathing the upper pseudobulbs with their enlarged bases, each bearing tiny bulbils at their margins. Stem glabrous and angled. Inflorescence cylindrical, rather lax, composed of very small flowers. Bracts small and narrow. Sepals broadly lanceolate, the dorsal slightly larger and pointing downwards, the laterals erect. Petals much smaller, lanceolate, spreading and strongly curved backwards. Lip erect, concave, similar in shape, but smaller than sepals.

Flowering period

August.

Geographical distribution

Circumboreal.

Habitat

The only population reported from Italy is found in a peat-bog, at about 1080 m.

Status and conservation

Because of its small size, green colour, and erratic flowering, this species is easily overlooked. To date a single population with no more than 20 specimens has been reported from Italy (Pedrotti, 1980).

It is listed as "endangered" in the "red book" of Italian plants (Conti, Manzi & Pedrotti, 1992).

Alto Adige (BZ), Valle di Anterselva, Rasun di Sopra, m 1100.

HERMINIUM Linnaeus

This genus is represented in Italy (and in Europe) by a single species which, in its flowering period, has only one sessile subglobose tuber (the source of its specific name *monorchis*), plus 2-5 others, much smaller and with long peduncles. The flowers are not showy and lack a spur; the pollinia have very short caudicles and relatively large, distinct viscidia.

The chromosome number is 2n=40.

The flowers of *Herminium monorchis* are pollinated by numerous insects, mostly by very small flies (the larger ones hardly longer than 1 mm). New plants are also produced vegetatively from the peduncled tubers.

x 3

Herminium monorchis (Linnaeus) R. Brown

Status and conservation

In Italy it is found in the Alps, in the sub-alpine zone, and in the Apuan Alps; it has recently been reported for the Basilicata (Fascetti et al., 1999). This species is quite uncommon in Italy.

Description

Slender plant up to 25 cm tall. Basal leaves usually two, opposite, the lower one broadly lanceolate, the upper longer and more slender; one or two small, bract-like leaves are found higher up the stem. Inflorescence lax, cylindrical, elongate. Bracts narrowly lanceolate, acute, shorter than the ovaries. Sepals greenish, lanceolate; petals paler, longer and narrower than sepals; lip as long as the petals, whitish to yellowish green, trilobed, with mid-lobe narrower and much longer then the side lobes; all the flower elements are directed forwards to form a loose, tiny bell.

Flowering period

From the end of May to mid July.

Geographical distribution

Eurasian, absent from most of southern Europe.

Habitat

Dry or damp meadows, sometimes in marshes, up to 1700 m, on calcareous or neutral soils.

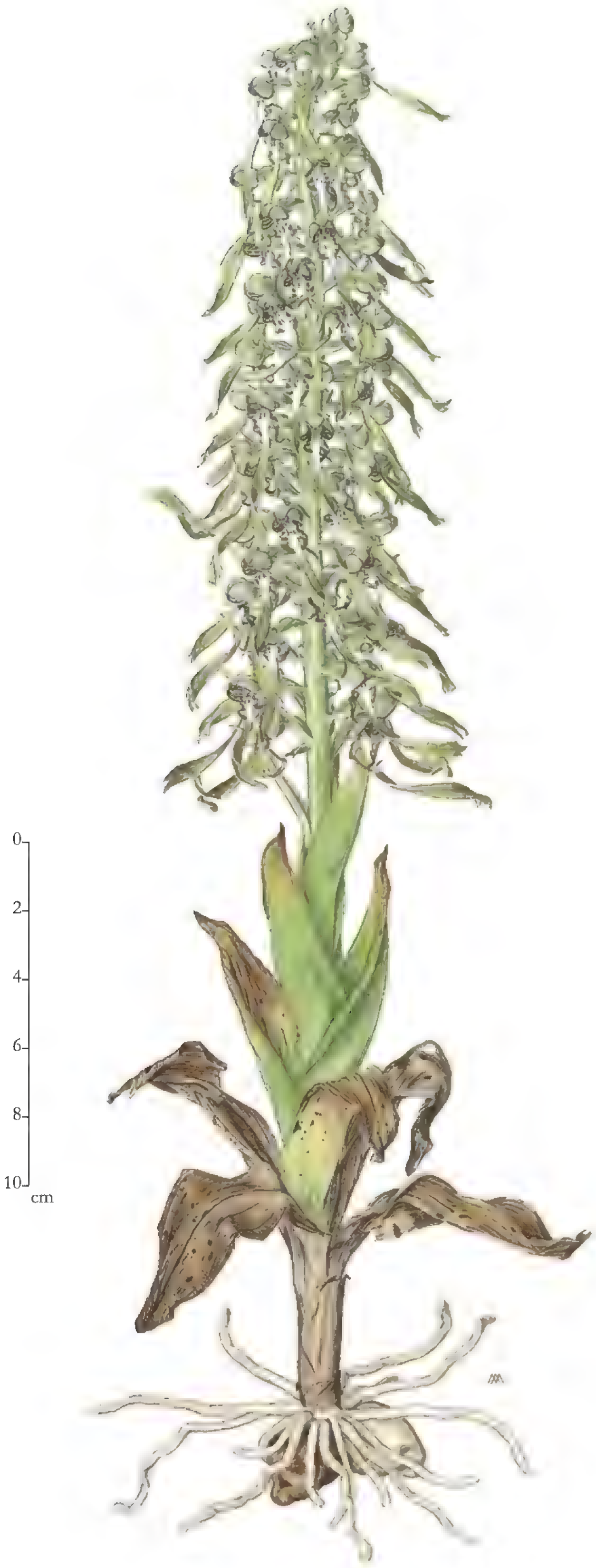
Tuscany (LU), Alpi Apuane, Fociomboli, m 1100.

HIMANTOGLOSSUM W.D.J. Koch

The flowers of the species currently included in the genus *Himantoglossum* all have a very long lip mid-lobe, but this showy character does not seem sufficient to separate these species from similar ones up to now included in the genus *Barlia*. The common characteristics to all these orchids are the presence of a spur, a single viscidium and bursicle, and large ellipsoid tubers.

The chromosome number is 2n=36.

The flowers of *Himantoglossum* in the strict sense are pollinated by solitary bees of the genera *Andrena* and *Colletes*, and by honey-bees.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Himantoglossum hircinum (Linnaeus) Sprengel subsp. **hircinum**

Systematics

Synonyms: *Loroglossum hircinum* (Linnaeus) L.C.M. Richard.

Description

Robust plant, 30-90 cm tall. Leaves pale green, quite large, the lower ones broadly lanceolate, often withered when the plant is in full flower, the upper ones narrower, acute, sub-erect, sheathing the stem. Inflorescence elongate, dense, composed of many flowers with a characteristic smell of goat. Bracts narrowly lanceolate, longer than the ovary. Sepals ovate, pale green, sometimes red margined outside, striped with purple inside, forming a hemispherical hood. Petals linear, hidden by the hood. Lip spirally rolled in bud, slightly twisted in open flowers, trifid, with lateral lobes very narrow, acute, crinkled on the outer edges, and the mid-lobe very long, strap-like, notched at the tip; spur conical, about 3 mm long. The base of the lip is whitish dotted with purplish tufts, while the extremities are pale green, greyish-green or olive-brown.

Flowering period

From May to mid July.

Geographical distribution

W-Mediterranean Atlantic, from southern England to northern Africa and southern Italy.

Habitat

Grassland and garrigue, up to 900 m, on dry, calcareous soil.

Status and conservation

In Italy it is found in western Liguria, in the southernmost portion of the peninsula, and in Sicily.

Puglia (FG), Gargano Peninsula, near Monte S. Angelo, m 650.

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Himantoglossum hircinum (Linnaeus) Sprengel subsp. **adriaticum** (H. Baumann) H. Sundermann

Systematics

This orchid was described as a species (*H. adriaticum* H. Baumann) and is reported as such in most publications. However, the genetic distance from subsp. *hircinum* is very small (unpublished), and in one of the contact areas between the two orchids, in southern Campania and in northern Calabria, specimens are found with intermediate morphological characters (Nazzaro et al., 2000).

Description

It differs from the subsp. *hircinum* by the narrower mid-lobe of the lip (no more than 2.5 mm wide), for the much more lax inflorescence, and for the colour of the lip, which is brownish red in most specimens; furthermore, the apex of the lip is frequently, although not constantly, bifid, and plants are usually taller (up to 105 cm).

Flowering period

May and June.

Geographical distribution

Not well defined because of possible confusion with other subspecies: northern and central Italy, Slovenia, Croatia, eastern Austria, Slovakia, and Hungary.

Habitat

Grassland and garrigue, usually in full sun, up to 1400 m, on calcareous soil.

Status and conservation

It has been reported from all the regions of the mainland, except for the Val d'Aosta and Apulia; it is absent from most of the Pianura Padana.

Tuscany (FI), near Pescina, m 450.

LIMODORUM Boehmer

The chromosome number is 2n=56, 60.

Although the flowers of *Limodorum abortivum* produce nectar, which accumulates in the long spur, visits from possible pollinating insects are few, mainly solitary bees and bumblebees. The seeds produced are usually the result of self-pollination, which is the only reproductive mechanism in the other two species (*L. brulloi* and *L. trabutianum*). In adverse conditions, such as long periods of drought or excessive growth of surrounding vegetation, self-pollination may occur even without the flowers opening (cleistogamy).

Key to the genus Limodorum

1	Bracts shorter than the ovary; lip as long as the sepals	***L. brulloi***
1*	Bracts longer than the ovary; lip shorter than sepals	**2**
2	Spur as long as the ovary	***L. abortivum***
2*	Spur not longer than 3 mm	***L. trabutianum***

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Limodorum abortivum (Linnaeus) Swartz

Habitat

Woodland and scrub, usually on calcareous soil, up to 1500 m.

Status and conservation

In Italy it is widespread throughout the country, but very unevenly distributed.

Description

Usually robust plant up to 80 cm tall. Stem brownish, greyish or violet, sheathed along the greater part of its length with large, greyish, bract-like leaves. Inflorescence cylindrical, elongated and rather lax at maturity. Bracts broadly lanceolate, longer than ovary. Flowers relatively large, usually violet. Lateral sepals spreading, lanceolate; dorsal sepal somewhat broader, convex, pointing forwards. Petals a little shorter and much narrower than sepals. Lip saddle-like, slightly shorter than sepals, veined with a deeper shade of violet, with a very narrow base, wavy margins, and downwards pointing tip; spur slender, about as long as the ovary, directed downwards.

Flowering period

From the end of April to the end of June.

Geographical distribution

Mediterranean mainly, reaching Belgium northwards and Iran eastwards.

Tuscany (FI), Pratolino, turkey oak-wood between Uccellatoio and Fosso delle Palaie, m 450.

Limodorum brulloi Bartolo et Pulvirenti

Description

Plant similar to *Limodorum abortivum*, but shorter and stouter, 20-50 cm tall. Bracts shorter than the ovaries. Lip as long as the sepals; spur 4-5 mm long, longer than in *L. trabutianum* and much shorter than in *L. abortivum*.

Flowering period

July.

Geographical distribution

Endemic to southern Italy.

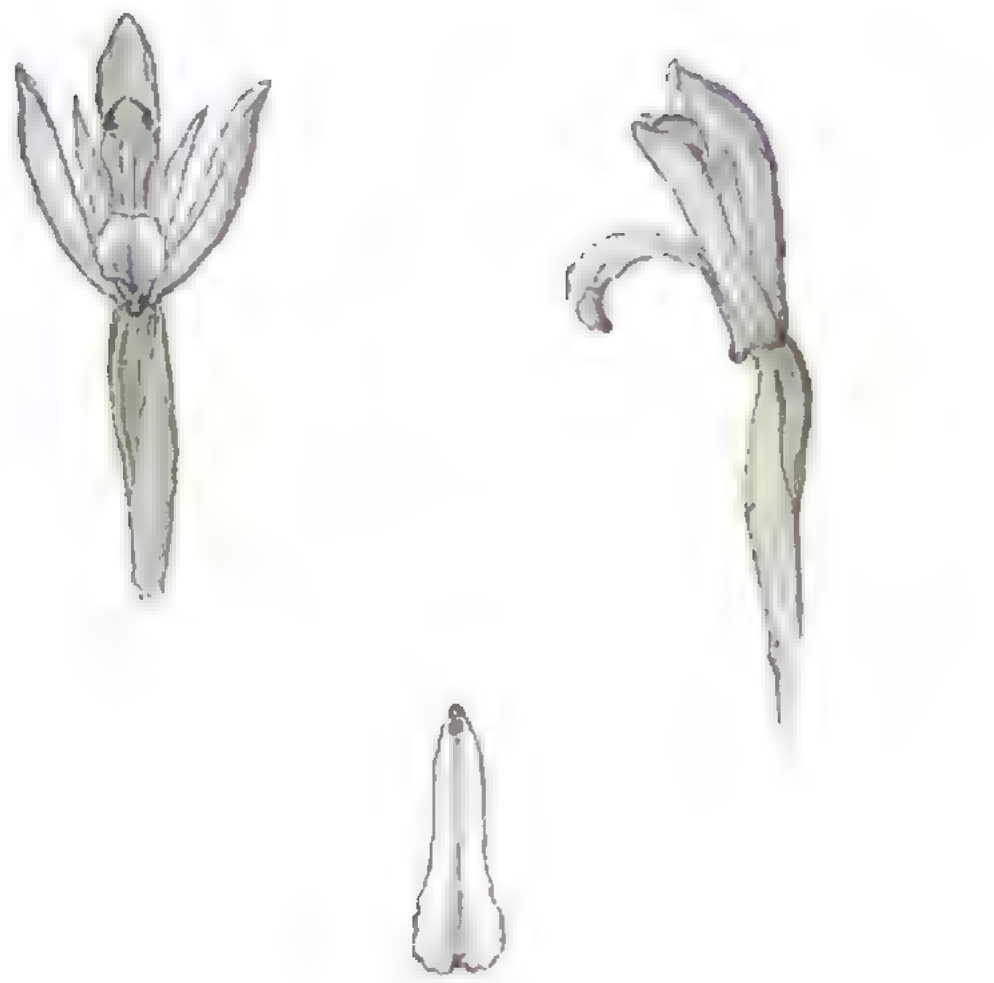
Habitat

Shady woodland, on both calcareous and siliceous soil, between 850 and 1400 m.

Status and conservation

To date, this species has only been found in Calabria, where it does not seem uncommon.

Calabria (CS), Sila Grande, Vallone Cecita, m 1150.



Limodorum trabutianum Battandier

Status and conservation

In Italy it is rather common in Sardinia, quite rare in Tuscany, Umbria, Latium, and the island of Pantelleria.

Description

Similar to *Limodorum abortivum*, but usually smaller and more slender, rarely exceeding 55 cm in height; however, specimens up to 70 cm tall with some 25 flowers have been observed both in Sardinia and Latium (Scrugli, 1990; Garcia, 1996). The main differences between these two species are found in the shape of the lip and in the length of the spur. In *L. trabutianum*, the former is strap-like, with a slightly enlarged, rounded tip; the latter is absent or very short, never exceeding 3 mm.

Flowering period

From the beginning of May to the beginning of June.

Geographical distribution

West-Mediterranean, reported from Portugal, Spain, France, Italy, Morocco, and Algeria.

Habitat

Open woodland and scrub, up to 900 m, usually on calcareous soil.

Sardinia (CA), Domusnovas.

LIPARIS L.C.M. Richard

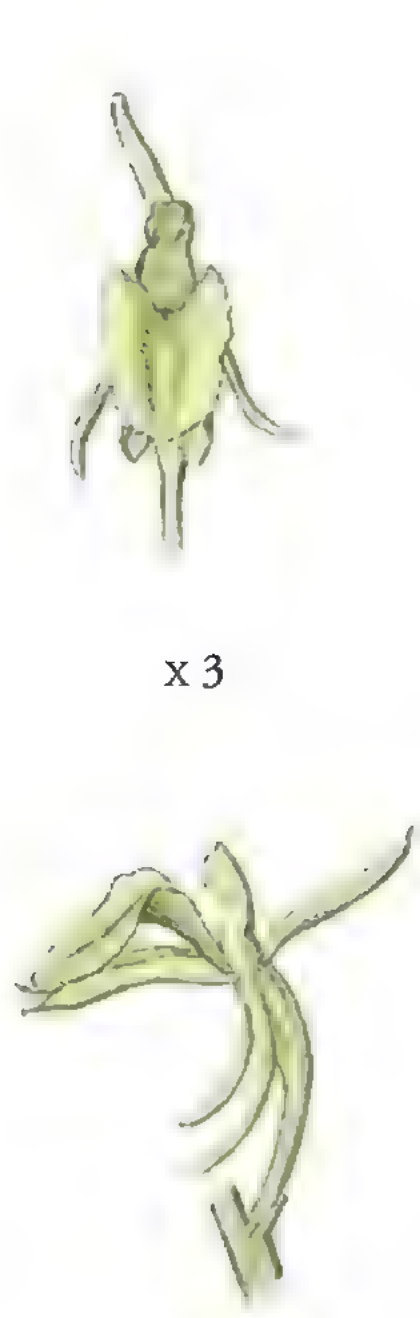
Stem enlarged at the base to form a pseudobulb, beside which remains the pseudobulb of the previous year; the flowers lack a spur, have two viscidia without bursicle and pollen divided into four pyriform, waxy masses.

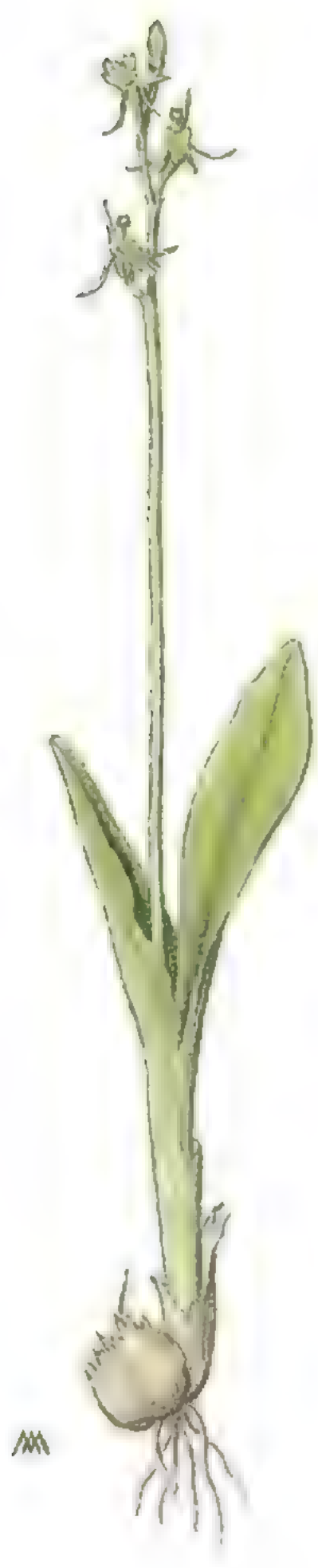
The genus has a very wide range and includes several hundred species, only one of which, *Liparis loeselii*, is found in Italy and in Europe.

The chromosome number is 2n=32.

There is no certain information on the pollination of *L. loeselii*; some authors think that it is a self-pollinating species and, in any case, it reproduces mainly by vegetative means.

x 3





Liparis loeselii (Linnaeus) L.C.M. Richard

Description

Small plant up to 15 cm tall. Basal leaves 2, arranged on opposite sides of the angled stem, the lower narrowly ovate, with obtuse apex, the upper elliptic, acute, and more or less erect. Inflorescence lax and composed of 4-8 (2-12) yellowish-green flowers. Bracts very small, triangular. Sepals spreading horizontally, linear-lanceolate, with strongly curved margins. Petals linear, very narrow, slightly shorter than sepals. Lip about as long as, but much broader than the sepals, saddle-shaped, with the irregular margins curved upwards. Column erect and elongate.

Flowering period

June and July.

Geographical distribution

Circumboreal.

Habitat

Marshes and peat-bogs, between 400 and 900 m.

Status and conservation

At present this species is only found in very few places in Trentino Alto Adige, Friuli and Lombardy, but has been reported in the past also from Piedmont, Veneto, and Tuscany, where it is now extinct because of drainage of marshes.

It is listed as "endangered" in the "red book" of Italian plants (Conti, Manzi & Pedrotti, 1992).

Friuli (UD), swamp between Sequals and Travesio.

LISTERA R. Brown

The Italian species of this genus have only two nearly opposite leaves, flowers without a spur and with the lip much longer than the other flower parts, a short column, a rostellum, and no viscidium or bursicle.

The chromosome number is 2n=34 (*L. ovata*), 38 (*L. cordata*).

Many insects visit the flowers of *Listera* to feed on the nectar secreted by glands on the lip. The most efficient pollinators of *L. ovata* are parasitic wasps (Ichneumonidae) and sawflies (Tenthredinidae). Pollinators of *L. cordata* are smaller, the most abundant being fungus-gnats.

Key to the genus Listera

1 Plant more than 20 cm tall; leaves ovate, over 3 cm long; upper stem covered with whitish hairs . ***L. ovata***

1* Plant less than 20 cm tall; leaves cordate, less than 3 cm long; upper stem almost glabrous ..... ***L. cordata***

x 5

Listera cordata (Linnaeus) R. Brown

Status and conservation

Sporadically present in all the regions of northern Italy as far south as Tuscany.

Description

Tiny plant 5-20 cm tall. Stem reddish-brown and pubescent above the insertion of leaves, pale green and glabrous below. Leaves 2, sub-opposite, heart-shaped, dark green, with undulate margins, inserted about half way up the stem. Inflorescence lax, composed of 5-12 small flowers coloured green tinged with red to purplish brown. Bracts triangular, very small (about 1 mm). Sepals ovate, spreading. Petals elliptic, as long as the sepals. Lip pendent, almost twice as long as sepals, trilobed, with very small side lobes near the base and a large mid-lobe deeply forked to form two narrow, pointed, and divergent lobules.

Flowering period

June and July.

Geographical distribution

Circumboreal.

Habitat

Coniferous woodland (mainly spruce), bilberry scrub, mossy marshes, from 900 to 2200m, on very damp, acidic soil.

Emilia Romagna (MO), Appennino Modenese, Val di Luce, along Rio del Pozzo, m 1300.

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Listera ovata (Linnaeus) R. Brown

Description

Slender plant 20-60 cm tall, rarely more. Stem green to brownish, quite hairy above the insertion of leaves. Leaves 2, sub-opposite, broadly ovate, ribbed, obtuse, bright green to yellowish green. Inflorescence elongate, usually lax, composed of many greenish to yellowish-green flowers. Bracts small and triangular. Sepals ovate, curved forwards. Petals sometimes tinged with brownish red on the margins, about as long but narrower than sepals, forming with these a loose hood. Lip about twice as long as sepals, strap-like, deeply bilobed at the apex, bent backwards in young flowers, then pendant, finally directed forwards after pollination.

Flowering period

From May to July.

Geographical distribution

Eurasian, from Iceland to Siberia; reported also from Canada.

Habitat

Woodland, scrubland and wet meadows, up to 2100 m, on acidic or calcareous soil.

Status and conservation

Reported from all the Italian regions, quite common in the north, but progressively less common to the south.

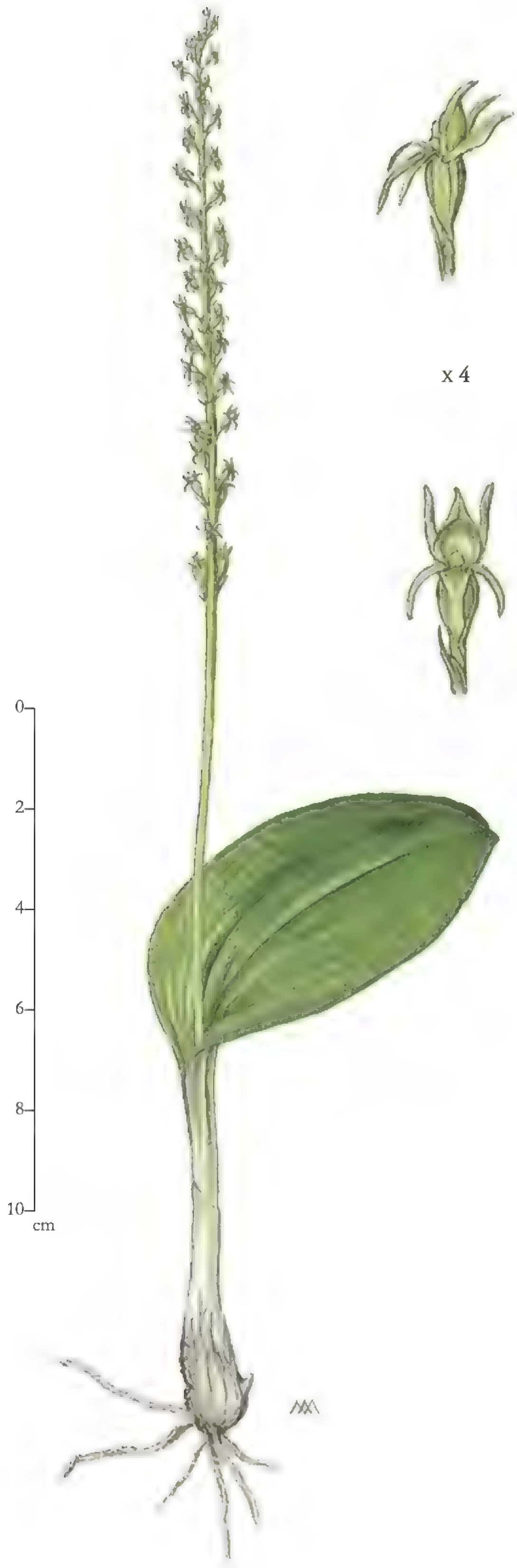
Tuscany (FI), pine-wood along the road to M. Morello, m 530.

Malaxis Swartz

Plants with two superimposed pseudobulbs, flowers lacking a spur, with an upwards directed lip, short column, and pollen divided in four waxy masses.

This vast, mainly tropical genus is represented in Europe by a single species, *Malaxis monophyllos*. The above mentioned characters refer essentially to this species, whose chromosome number is 2n=30.

The tiny flowers of *M. monophyllos* seem to be pollinated by small flies.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Malaxis monophyllos (Linnaeus) Swartz

Systematics

Synonyms: *Microstylis monophyllos* (Linnaeus) Lindley.

Description

Slender plant 10-30(40) cm tall, wholly greenish. Stem glabrous, angled above, arising from a whitish pseudobulb surrounded by old leaf sheaths. A single elliptic sheathing leaf is usually present, but sometimes there is a second, smaller leaf opposite to the former. Inflorescence rather lax, cylindrical, elongate, composed of very small, greenish flowers. Bracts small, narrow and acute. Sepals lanceolate, with the tips curving backwards, the side ones erect, the median pointing downwards. Petals linear, slightly shorter but much narrower than sepals. Lip erect, as long as the petals, entire, broadly triangular, with a wide, concave basal portion and a narrow tip slightly curving backwards. The ovary is small, obovate, with a relatively long peduncle.

Flowering period

July.

Geographical distribution

Circumboreal, absent from southern Europe and west of the Alps.

Habitat

Damp meadows, woodland margins, frequently among mosses, from 1000 to 1600 m.

Status and conservation

A rare species in Italy, reported only from the Trentino Alto Adige, Lombardy, Veneto and Friuli.

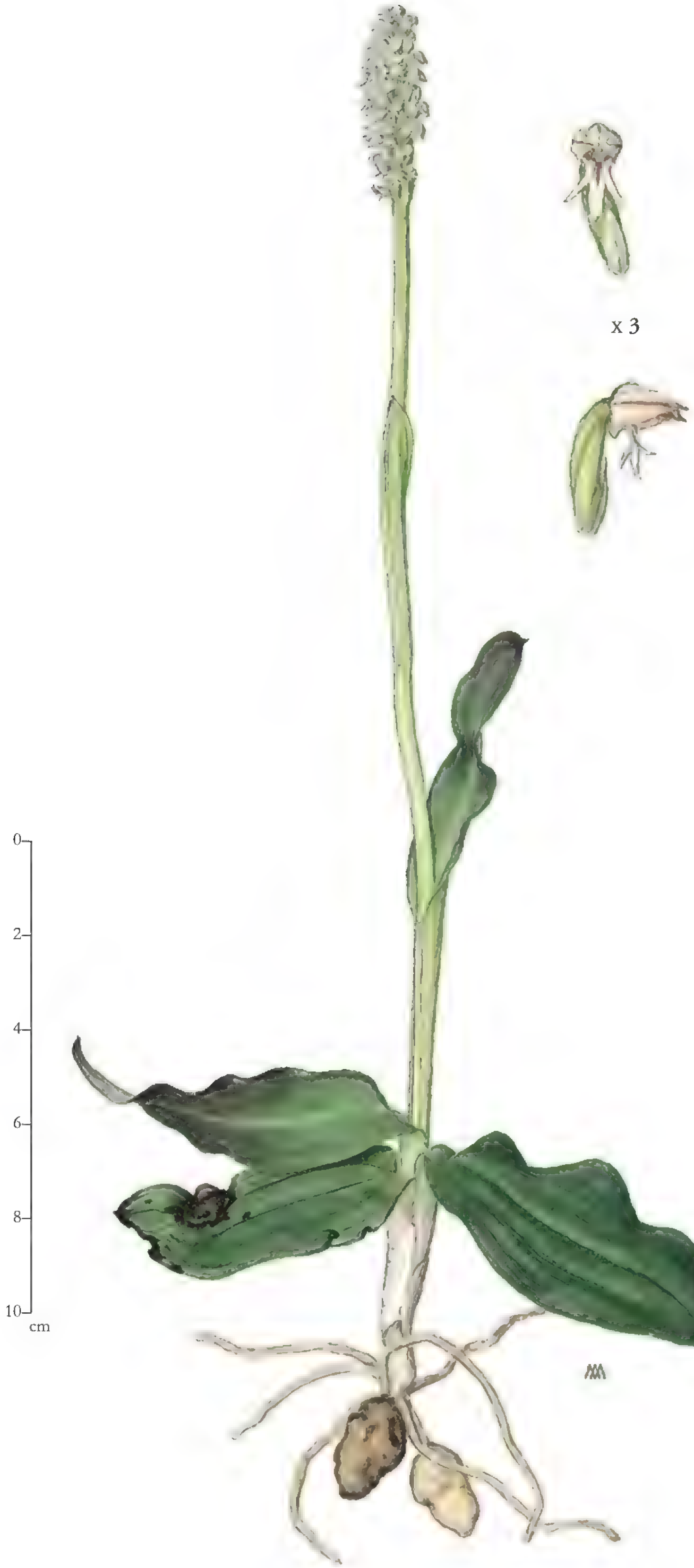
Friuli (UD), Sella Nevea, m 1150.

NEOTINEA Reichenbach fil.

The only characteristics which distinguish this monospecific genus from *Orchis* (sensu lato) are the very short spur and the very short caudicles of the pollinia. Apart from these small differences, the resemblance between *Neotinea maculata* and certain Orchis species (for example *O. ustulata*) is quite evident.

The chromosome number is 2n=42.

Neotinea maculata is an autogamous species; sometimes self pollination occurs even before the flowers have opened.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Neotinea maculata (Desfontaines) Stearn

Description

Small plant, 10-30 cm tall. Leaves greyish-green to deep green shaded with violet, sometimes bearing deep violet spots, the lower ones quite broad, oblong, mucronate, spreading, the upper narrower, acute, erect, sheathing the stem. Inflorescence ovoid to cylindrical, quite dense, almost one-sided, composed of small flowers. Bracts membranaceous, lanceolate, acute, much shorter than the ovary. Sepals broadly lanceolate, forming an elongate hood which is whitish, shaded with pale yellow, green or pink, with purplish or pinkish spots and streaks. Petals linear, slightly shorter and much narrower than sepals, concealed by the hood. Lip about as long as sepals, whitish, often with purplish spots and streaks near the base, deeply trilobed, with side lobes linear, and mid-lobe much longer, strap-like, toothed or bifid at the apex; spur conical, very short (1-2 mm).

Flowering period

From mid March to mid June.

Geographical distribution

Mediterranean-Atlantic, from the Canary Islands to the Near East; also in southern Ireland and in the Isle of Man.

Habitat

Scrubland, open woods, pine-woods, garrigue, up to 1500 m, on alkaline to acidic, dry to damp soil.

Status and conservation

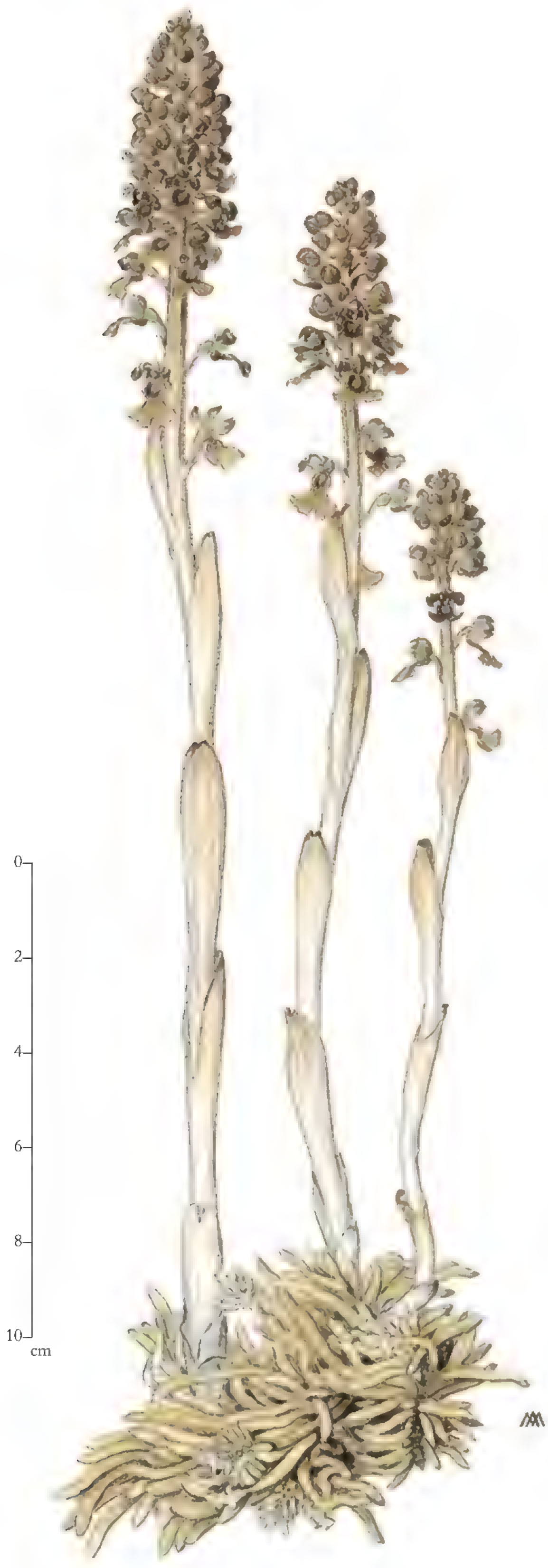
Present in all the regions of central and southern Italy, in the islands, in Emilia Romagna and in Liguria.

Tuscany (GR), near Sticciano, m 300.

These plants are completely yellowish-brown and lack green leaves; their underground portion consists of a short rhizome from which grows a mass of short thick roots which resembles a birds-nest. The flowers are peduncled, have no spur, have an elongate column with a rostellum and no viscidia or bursicles. This genus is allied to *Listera* and has only one species in Italy and Europe.

The chromosome number is 2n=36.

The flowers produce nectar and are visited by numerous insects, especially flies. The most important reproductive mechanism, however, seems to be self-pollination. Cases have been noted in which plants of *Neottia* have succeeded in flowering and producing seeds without even emerging from the ground.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Neottia nidus-avis (Linnaeus) L.C.M. Richard

Status and conservation

Quite common in Italy, recorded from all its regions.

Description

Plant 15-50 cm tall, yellowish brown throughout. Stem pubescent, rather thick, bearing a few large, sheathing scales with obtuse apex. Inflorescence cylindrical, quite dense, but more open below. Bracts narrow and acute, about as long as the ovary (stalk included). Sepals and petals ovate, curved forwards to form a loose hood. Lip about twice as long as other perianth segments, slightly concave at the base, the tip divided into two, divergent lobes irregularly rounded and toothed at the ends.

Flowering period

From the end of April to July.

Geographical distribution

Eurasian, from the British Isles east to Japan.

Habitat

Shady woods, up to 1800 m, on alkaline to neutral soil.

Tuscany (FI), Sesto Fiorentino, near Cappella di Ceppeto, m 550.

NIGRITELLA L.C.M. Richard

We have already spoken of the affinity between the genera *Nigritella* and *Gymnadenia* in the introduction to the latter genus. The species of the genus (or subgenus) *Nigritella* are all strictly linked to a mountain environment and are characterized by flowers with the lip pointing upwards, by a very short spur, and small stature. In recent years numerous works have been published on these orchids and the number of described species has grown considerably, as in other genera. In Italy we have passed from the two species reported by Pignatti in his "Flora d'Italia" (1982) to today's eight species. The systematic position of some of these, however, is yet to be verified.

In this book the four "older" species are dealt with; the others are:

- *Nigritella buschmanniae* Teppner et Ster, similar to *N. widderi* Teppner et E. Klein from which it is distinguished by the more rounded apex to the inflorescence, the darker flower colour and different chromosome number. In any case there is no possibility of confusion, *N. buschmannie* being an alpine entity reported exclusively from a few localities of the Brenta group (Trentino) while *N. widderi* is an Apennine species (in Italy).

- *Nigritella cenisia* G. Foelsche, W. Foelsche, M. Gerbaud et O. Gerbaud, morphologically very similar to *N. corneliana* (Beauverd) Gölz et H.R. Reinhard. It is distingushed from the latter chiefly by the much darker colour of its flowers and it is reported in Italy only from the Cozie and Graie Alps, near the French border.

- *Nigritella dolomitensis* (Teppner et E. Klein) Hedrén, E. Klein et Teppner, similar in every way to *N. rubra* except that the lateral margins of the lip are less raised. For the moment it is reported only from the Alto Adige and doubtfully from theTrentino.

- *Nigritella nigra* subsp. *austriaca* Teppner et E. Klein, practically indistinguishable in the field from *N. rhellicani* Teppner et Klein, with which it shares the same distribution area and habitat. It differs from *N. rhellicani* in having a double chromosome number (2n=80) and bracts with smooth edges.

From a reproductive point of view, the species are divided into two groups: the diploids, with a chromosome number 2n=40, that reproduce sexually; the polyploids (2n=80, 2n=100) with apomictic reproduction. *N. rhellicani*, *N. corneliana* and *N. cenisia* are diploids; *N. buschmanniae* is the only pentaploid (2n=100); the other four are tetraploids (2n=80).

Much data has been published on the pollination of *N. rhellicani*: numerous pollinating insects have been noted including butterflies, beetles and flies (see the "old" work of Muller, 1881). Although many authors agree that butterflies are the most common visitors, the small size and the dark colour of the flowers, their very short spur and penetrating perfume would make them seem better adapted to pollination by flies. It is worthy of note that the apomictic species (at least the Italian ones) have all preserved an intense perfume and an amount of nectar not unlike that of the allogamous species. These apparently useless characters would seem to show a rather recent origin of the apomictic species deriving from the allogamous ones.

Key to the genus Nigritella

1 Lip concave, with lateral margins slightly curving upwards; flowers usually blackish-brown ... ***N. rhellicani***

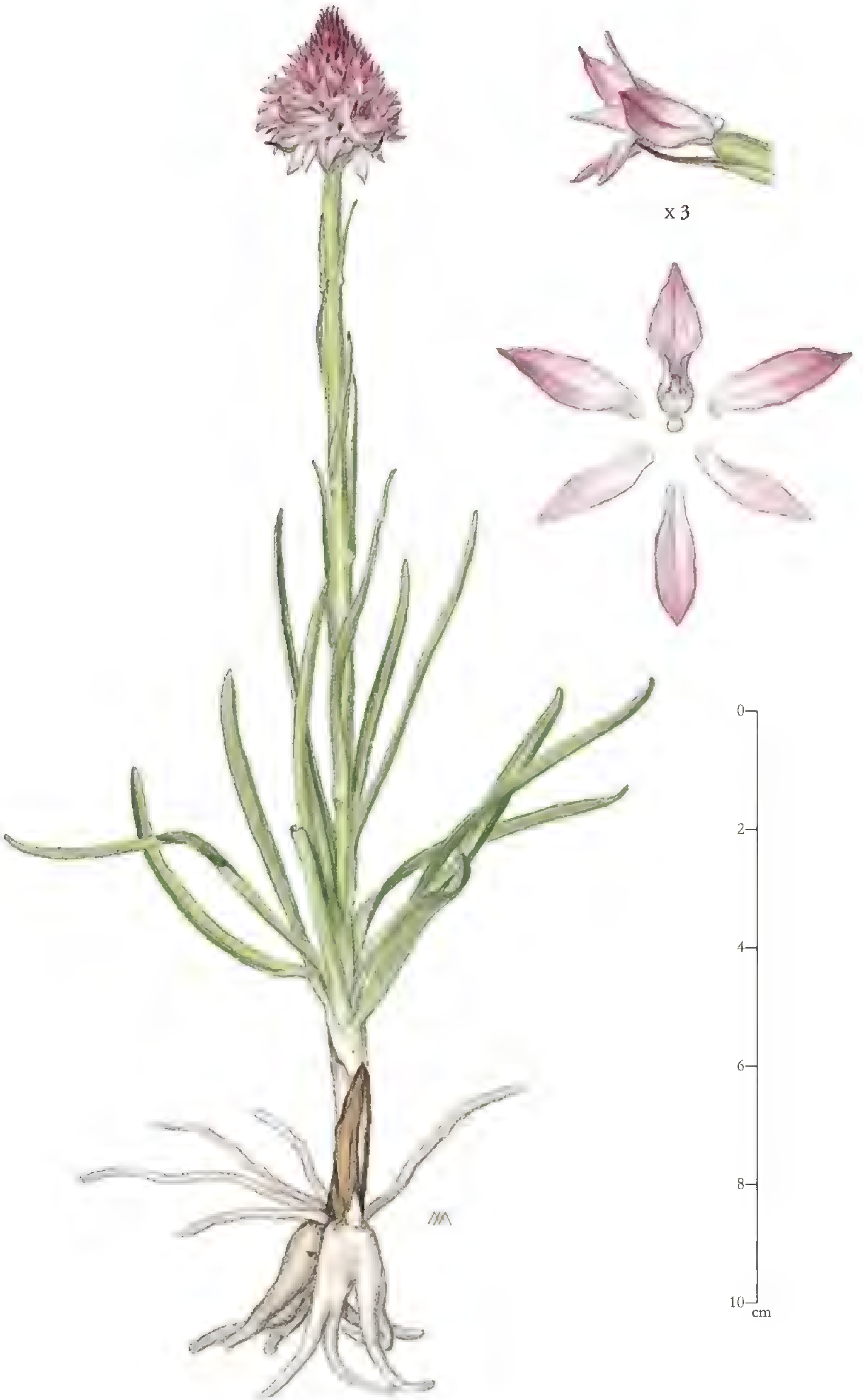
1* Lateral margins of the lip strongly curving upwards and almost touching; flowers ruby or pinkish **2**

2 Flowers ruby; inflorescence elongate ..... ***N. rubra***

2* Flowers pinkish; inflorescence conical to ovoid **3**

3 Plants seldom reaching 15 cm; lip constricted near the middle ..... ***N. widderi***

3* Plants usually exceeding 15 cm; lip constricted near the base ..... ***N. corneliana***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Nigritella corneliana (Beauverd) Gölz et H.R. Reinhard

Status and conservation

From the Graie to the Maritime Alps, quite rare and localized.

Systematics

Synonyms: *Nigritella nigra* (Linnaeus) Reichenbach fil. subsp. *corneliana* Beauverd.

Description

Similar to *Nigritella rhellicani* but somewhat larger and stouter. Inflorescence at first conical, than hemispherical and more or less elongate. Flower elements bicoloured, their tip pale to deep pink, becoming gradually much paler towards the base. Lateral margins of the lip curved upwards, forming a marked constriction near the base.

Flowering period

From the beginning of July to mid August.

Geographical distribution

Western Alps.

Habitat

Alpine meadows, from 1000 to 2200 m, on dry to moderately damp, calcareous soil.

Piedmont (CN), Valle Garbella, Palanfré, m 1650.

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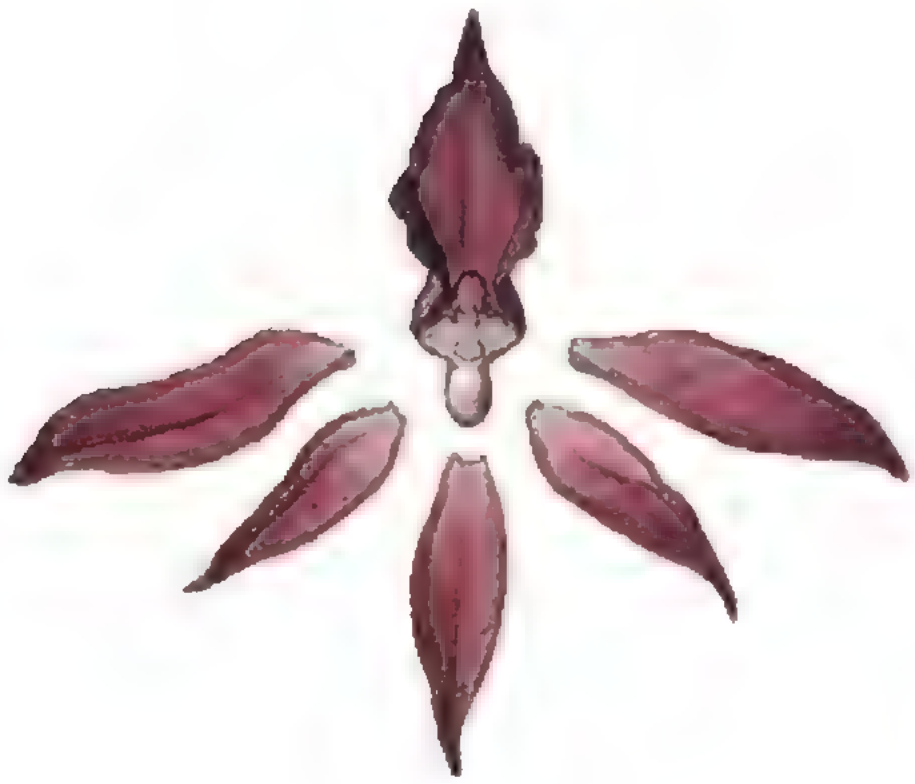
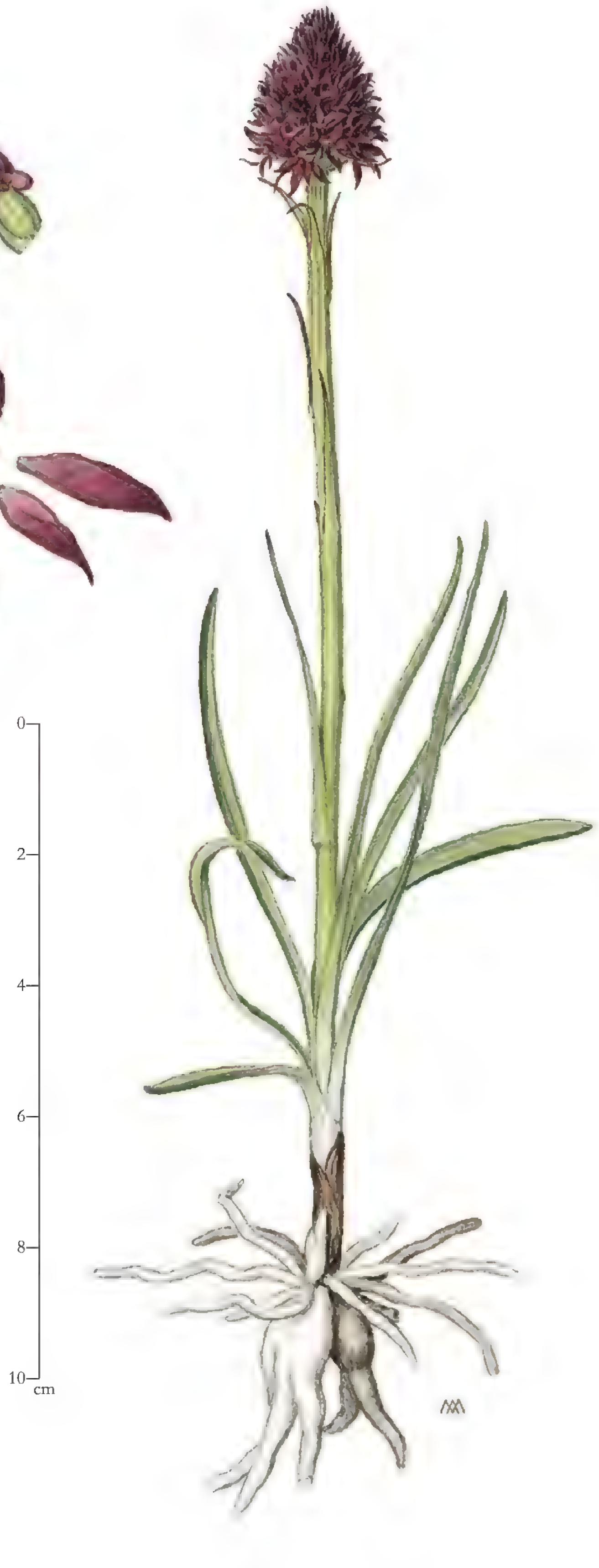




Nigritella rhellicani Teppner et E. Klein

Systematics

Synonyms: *Nigritella nigra* (Linnaeus) Reichenbach fil. *pro parte*.

Description

Small plant, 5-25(30) cm tall. Stem distinctly ridged. Lower leaves spreading to erect, very narrow and acute, linear, channelled, the upper ones much smaller and bract-like, sometimes margined reddish brown. Inflorescence short and compact, at first conical, than ovoid, composed of numerous small flowers with a strong scent of chocolate. Bracts narrow and acute, the lower ones equalling the flowers in length, the tip and the margins tinged with reddish brown, minutely toothed at the edges. Sepals spreading, lanceolate, and acute. Petals similar to, but slightly shorter and narrower than sepals. Lip erect, about as long as the sepals but much broader, roughly heart-shaped, more or less concave, the tip triangular with irregular margins; spur very short, less than 2 mm long, slightly longer than its maximum width, with a blunt tip. The flower colour is usually a very dark brownish-purple, rarely red, pink, orange, yellow, white, or even bicoloured. Ovary ellipsoidal, about twice as long as broad.

Flowering period

From the end of June to the beginning of August.

Geographical distribution

Mountains of central and southern Europe.

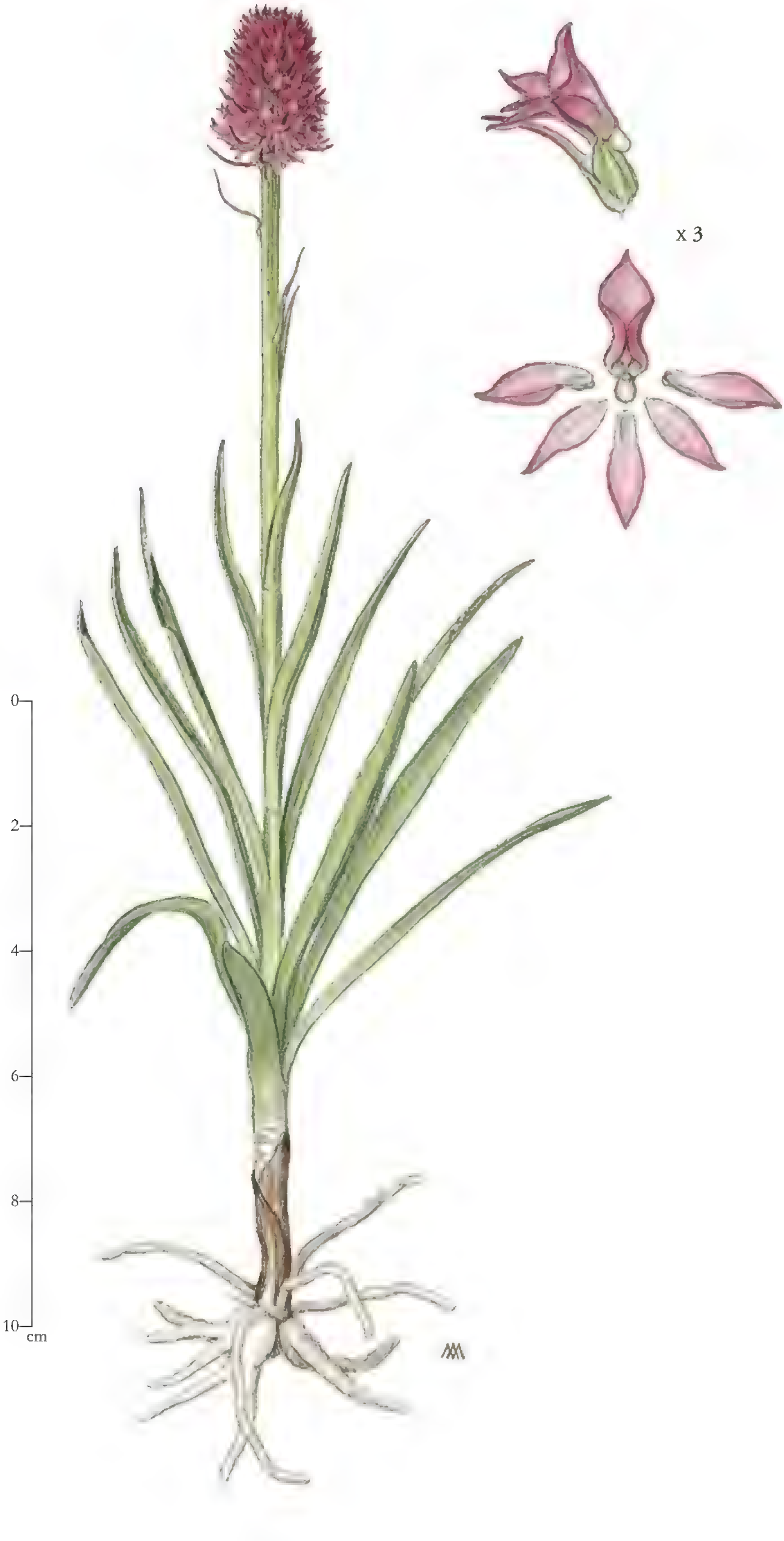
Habitat

Alpine prairies, from 1000 to 2600 m, on dry to moderately damp, calcareous soil.

Status and conservation

Found, sometimes in large numbers, in the Alps; very uncommon in the northern Apennines, in the Emilia Romagna region.

Friuli (UD), Altipiano di Montasio, near Rifugio G. di Brazzo, m 1600.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Nigritella rubra (Wettstein) K. Richter

Systematics

Synonyms: *Nigritella nigra* (Linnaeus) Reichenbach fil. subsp. *rubra* (Wettstein) Beauverd; ? *N. miniata* (Crantz) Janchen (if the latter synonymy is confirmed, the name *miniata* has priority).

Description

Similar to *Nigritella rhellicani* in general habit but somewhat taller and with a more elongated inflorescence. Bracts pale green, the lower ones distinctly longer than flowers and margined with purplish red, the upper ones shorter than flowers, with the purplish tinge extended to the upper half. Flowers ruby-red. Lip broadly ovate, acute at the apex, with lateral margins more or less curved upwards and sometimes almost touching. Ovary more elongate than in *N. rhellicani*.

Flowering period

From the end of June to the beginning of August (one or two weeks before *N. rhellicani* where the two species live together).

Geographical distribution

Alps and Carpathians.

Habitat

Alpine meadows, from 1300 to 2600 m, on dry to moderately damp, calcareous soil.

Status and conservation

In Italy it is found in the central and eastern Alps.

Friuli (UD), Altipiano di Montasio, near Rifugio G. di Brazzo, m 1600.

x 3

Nigritella widderi Teppner et E. Klein

Status and conservation

In Italy it is found on the higher mountains of the central Apennines, in southern Marche, Abruzzo, eastern Latium, northern Molise.

Description

Similar to *Nigritella rhellicani* but smaller, never reaching 20 cm in height. Inflorescence hemispherical. Flowers pinkish, becoming much paler and almost whitish when aged. Lateral margins of the lip curved upwards and almost touching in the middle, thus forming a narrow tube.

Flowering period

From the end of June to the end of July.

Geographical distribution

Mountains of Styria (Austria) and of Bavaria (Germany), and central Apennines.

Habitat

Alpine meadows, from 1900 to 2400 m, on dry, calcareous soil.

Abruzzo (AQ), M. la Meta, m 2200.

OPHRYS Linnaeus

Few other orchid genera are so easily recognizable at first sight as the genus *Ophrys*. The most notable characteristic is the lip, lacking a spur and more or less covered with hairs, which resembles the abdomen of an insect. Sometimes the other flower parts help to increase this resemblance (see, for example, *Ophrys insectifera*, page 199).

The chromosome number is 2n=36.

The geographical distribution of the genus *Ophrys* ranges from the Canary Islands to the Caspian Sea and from Scandinavia to North Africa, with the highest concentration of species around the Mediterranean Sea.

In few other plant genera have we seen such an increase in the number of species described in recent years as in this genus. We have to await the results of studies using molecular markers in order to know whether the criteria currently used in distinguishing species is valid or not. The first data obtained with the use of these techniques (Grunanger et al., 1998), although quite preliminary, show very small genetic distances even between species which are easily distinguishable morphologically. This leads us to predict a drastic reduction of the number of species currently recognized which, according to some authors, is already over 150 at the moment.

Given the above, it is obvious that the treatment of the species in the following pages is provisional and is a compromise between the convictions of the author and the taxonomy currently in fashion.

The pollination of species of *Ophrys* has been thoroughly studied. It is based on the production of volatile substances (pheromones) which have a strong sexual attraction for the males of certain species of the Hymenoptera. The insects, further attracted by visual and tactile stimuli, make a vain attempt to mate with the flowers mistaken for females of their species. During this process the pollinia adhere to the body of the insect and are transferred to another flower as the insect again tries to mate with it. *Ophrys* species can be divided into two groups: one is made up of species in which the pollinating insect positions itself with the abdomen towards the apex of the lip so that the pollinia adhere to his head; the other group includes the species in which the shape of the flower induces the insect to position its head towards the apex of the lip and the pollinia therefore adhere to the tip of its abdomen. If each species of *Ophrys* were pollinated exclusively by a single insect species the presence of natural hybrids would be virtually impossible. In reality one can find an extraordinarily high number of natural hybrids, some even between two species belonging to the two groups mentioned above (Danesch & Danesch, 1972; Rossi, Contorni & Liuti, 1990). This gives rise to doubts about the use of pollinating insects as a distinguishing character between *Ophrys* species.

Ophrys apifera has a supplementary pollination mechanism. If insects fail to visit the flower the caudicles which support the pollen masses bend forwards bringing the pollen into direct contact with the stigma below, thus carrying out self-fertilization. Autogamy is particularly advantageous in areas and in habitats where there are few insects.

Some *Ophrys* species produce supplementary tubers, which give rise to new plants. This mechanism is seen frequently in O. bombyliflora, but is also present in other species.

Key to the genus Ophrys

1 Tip of column obtuse or blunt **2**

1* Tip of column acute **8**

2 Lip lacking apical appendage **3**

2* Lip bearing apical appendage 7

3 Petals filiform; dorsal sepal more or less erect ..... ***O. insectifera***

3* Petals flattened, more or less strap-like; dorsal sepal arched forwards **4**

4 Lip broadly ovate, surrounded by dense, reddish-brown hairs ..... ***O. ciliata***

4* Lip elongate, velvety, lacking long hairs **5**

5 Margin of lip flat or slightly concave ..... ***O. lutea***

5* Margin of lip more or less convex **6**

6 Lip bent down at a right angle near the base ..... ***O. pallida***

6* Lip straight or almost so ..... ***O. fusca***

7 Sepals and petals greenish; apical appendage of lip directed backwards ..... ***O. bombyliflora***

7* Sepals and petals pink or whitish; apical appendage curved upwards ..... ***O. tenthredinifera***

8 Tip of column long and sinuous ..... ***O. apifera***

8* Tip of column straight or slightly curved **9**

9 Speculum relatively simple, not reaching the base of the lip **10**

9* Speculum more or less complex and touching the base of the lip **15**

10 Lip distinctly concave lengthwise, saddle-shaped; stigmatic cavity taller than broad ..... ***O. bertolonii***

10* Lip straight or slightly concave lengthwise; stigmatic cavity wider than tall **11**

11 Petals large, wider than 5 mm ..... ***O. promontorii***

11* Petals less than 5 mm wide **12**

12 Lip trilobed, so strongly convex as to appear narrow and elongate; sepals narrow, elongate, always pinkish ..... ***O. lunulata***

12* Lip entire or slightly trilobed, not narrow and elongate; sepals of various colours and forms **13**

13 Petals velvety, with usually straight margins ..... ***O. crabronifera***

13* Petals glabrous, at most with ciliate margins, which are often undulate **14**

14 Lip dark brown, surrounded by a fringe of longer and paler hairs; sepals and petals usually greenish ..... ***O. tarentina***

14* Lip blackish; sepals and petals variably coloured ..... ***O. bertoloniiformis***

15 Lip deeply trilobed, with mid-lobe so strongly convex as to appear ellipsoid and with side lobes conical, usually elongate ..... ***O. scolopax***

15* Lip entire or slightly trilobed, with mid-lobe more or less convex but not ellipsoid **16**

16 Petals velvety, often less than half the length of sepals; lip with a large apical appendage **17**

16* Petals glabrous or slightly pubescent, more than half the length of sepals; lip with a small apical appendage **21**

17 Lip bright yellow for the most part, with a small reddish-brown area at the base; petals whitish, very short, not exceeding 3 mm in length ..... ***O. lacaitae***

17* Lip and petals not as above **18**

18 Lip lacking marginal hairs around its apical portion **19**

18* Lip bearing marginal hairs also around its apical portion **20**

19 Sepals usually greenish; lip slightly convex in the middle and concave at the margins ... ***O. oxyrrhynchos***

19* Sepals seldom greenish; lip more or less convex, with the margins not distinctly concave .... ***O. fuciflora***

20 Petals shorter than 3 mm; apical appendage of the lip longer than 2.5 mm ..... ***O. discors***

20* Petals usually longer than 3 mm; apical appendage of the lip shorter than 2.5 mm ..... ***O. tetraloniae***

21 Sepals and petals prevalently greenish **22**

21* Sepals and petals variably coloured, occasionally greenish **23**

22 Basal protuberances of the lip short or inconspicuous ..... ***O. sphegodes***

22* Basal protuberances of the lip well-developed and shiny on the inner sides ..... ***O. incubacea***

23 Lip with its apical portion strongly convex, speculum usually without a paler margin, and apical appendage very small ..... ***O. exaltata***

23* Lip not as above ..... ***O. tyrrhena/O. morisii***

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Ophrys apifera Hudson

Description

Plant 15-50 cm tall. Basal leaves pale green, broadly lanceolate to oblong, sometimes with wavy margins; upper leaves sheathing the stem. Inflorescence lax, composed of 3-12(15) flowers. Bracts broadly lanceolate, distinctly longer than the ovary. Sepals large and broad, oblong, with obtuse apex, the side ones usually spreading, the dorsal erect or deflexed, coloured pale pink to violet-red, or pure white, always with a green median vein. Petals usually very short, linear to triangular, enlarged at the base, pubescent, greenish or pinkish. Lip trilobed, with the side lobes extending forwards into two conical, pointed humps, which are hairy outside; mid-lobe hemispherical, dark brown or reddish brown margined with yellowish green, pubescent at the apex, with apical appendage usually triangular, pointing backwards or downwards; speculum quite variable, formed by a glossy, ovate or semi-ovate reddish area at the base, surrounded by very irregular yellowish bands alternate with violet to brownish bands; sometimes the external yellowish area extends forwards into two longitudinal stripes or dots: as a whole the pattern broadly forms an H, a W, or a butterfly. Column forming a right or slightly obtuse angle with the lip, ending in a long, narrow, sigmoid tip.

Flowering period

From mid April to mid July.

Geographical distribution

Mediterranean-Atlantic.

Habitat

Grassland, garrigue, scrub, and open woodland up to 1400 m, on dry to fairly damp, calcareous soil.

Status and conservation

Reported from all the Italian regions.

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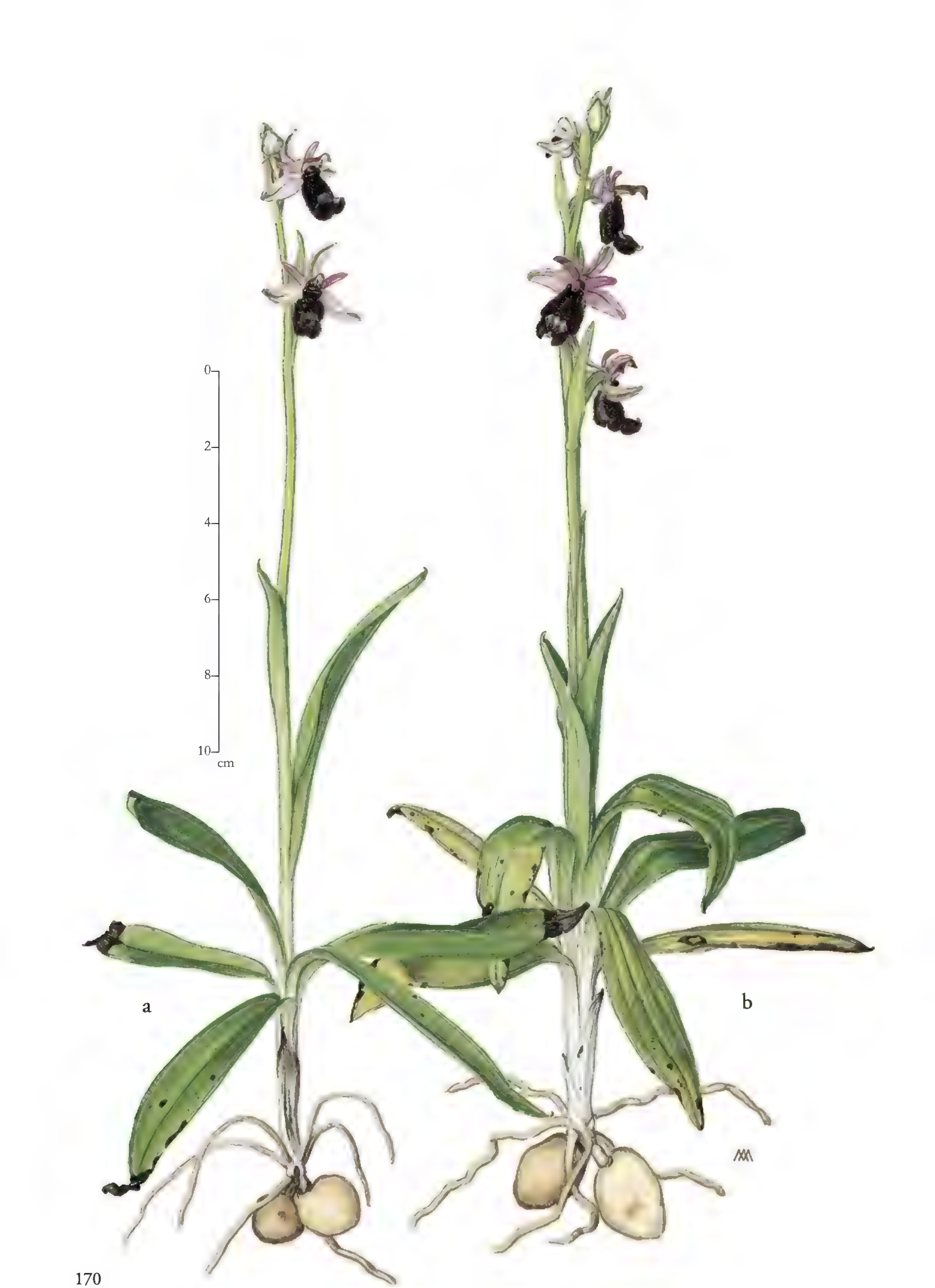
a. Tuscany (FI), near Pratolino, m 450; b. Tuscany (GR), Maremma Natural Park.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Ophrys bertolonii Moretti

Description

Plant 15-40 cm tall. Lower leaves oblong- lanceolate, forming a rosette, the upper ones erect and sheathing the stem. Inflorescence lax, composed of 2-8 flowers. Bracts pale green, much longer than the ovaries. Sepals narrowly ovate, concave, usually pinkish, less commonly whitish or reddish, with a green median vein, the laterals spreading, the dorsal variably curving forwards or bent backwards. Petals quite long, narrowly lanceolate, pinkish to purplish, with a darker, ciliate margin. Lip entire, or trilobed with side lobes much smaller than the mid, saddle-shaped, clearly depressed in the centre, covered with a dense, blackish-brown fur, except for a large, shiny, frequently shield-shaped, violaceous spot with bluish hues, which is sometimes surrounded by a narrow pale margin; this spot is clearly displaced towards the tip; apical appendage, greenish-yellow, obtuse, curving upwards. Column slender, with a short and acute tip.

Flowering period

March to June.

Geographical distribution

Central-Mediterranean. Distribution not well defined because of confusion with closely related entities; in its more typical form it is found in Italy, in the former Yugoslavia from Istria to Montenegro, and on the island of Corfu (Greece).

Habitat

Poor grassland, garrigue, scrubland, and stony areas, up to 1000 m, on dry to somewhat moist, calcareous soil.

Status and conservation

Found in Emilia Romagna, central and southern Italy, and in Sicily.

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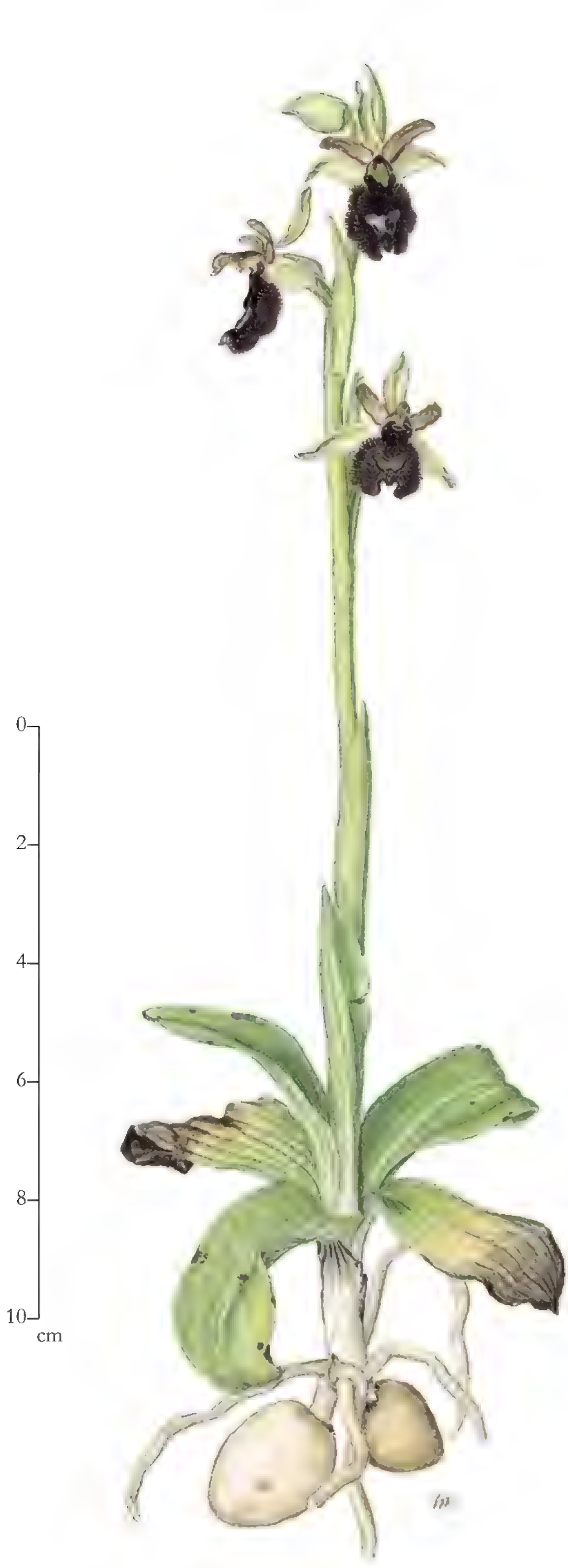
a. Tuscany (GR), near Alberese; b. Tuscany (FI), near Pratolino, 450 m.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Ophrys bertoloniiformis O. et E. Danesch subsp. **bertoloniiformis**

Habitat

Poor grassland, garrigue and scrubland, up to 850 m, on calcareous, sometimes stony, dry soil.

Status and conservation

Reported only from the Gargano peninsula, but in southern Latium are found hybrid swarms between *Ophrys bertolonii*, *O. sphegodes* and *O. promontorii* among which are specimens indistinguishable from those described above.

Description

Plant relatively small and stocky, 10-25 cm tall. Inflorescence lax, composed of 2-5 flowers. Sepals broadly lanceolate, spreading or bent backwards, usually greenish, less commonly whitish or pink. Petals oblong to lanceolate, very variably coloured: greenish, olive-green, ochre, pale pink. Lip entire, relatively short, slightly concave lengthwise, covered with thick, blackish hairs, with basal humps hardly prominent; speculum shiny grey, usually large and shield-shaped, less commonly horseshoe-shaped or with a darker spot in the middle; apical appendage greenish, small, triangular, straight or curving upwards. Column ending in an acute tip.

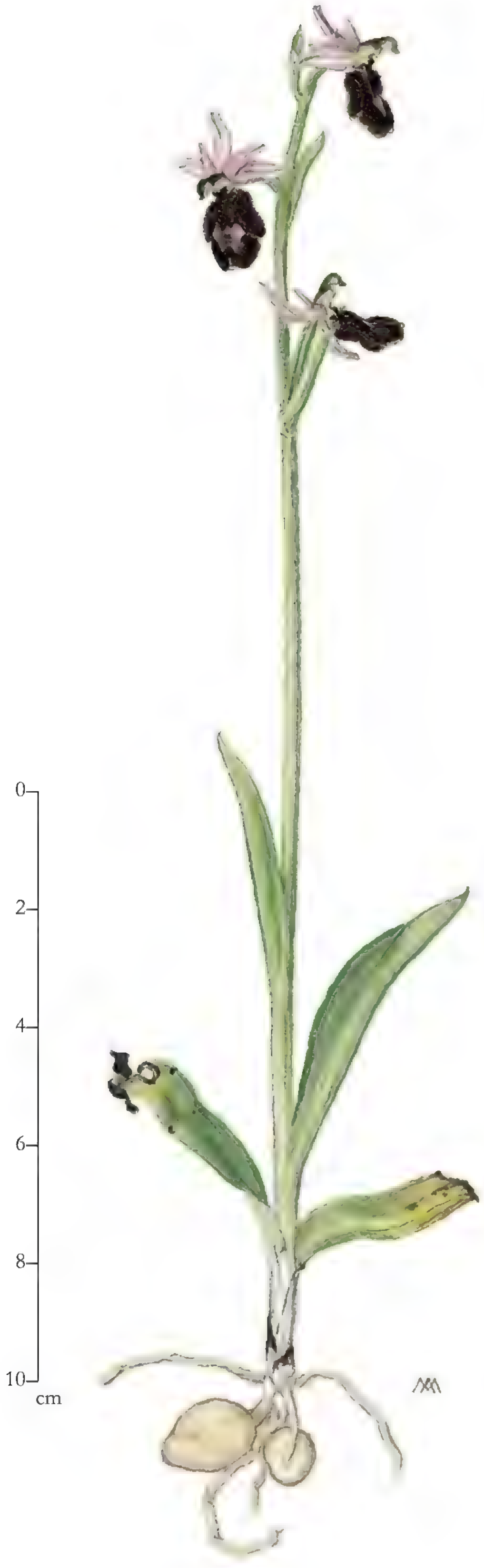
Flowering period

From the end of March to the beginning of May.

Geographical distribution

Endemic to southern Italy.

Apulia (FG), Gargano Peninsula, M. S. Angelo, loc. Campolato, m 700.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Ophrys bertoloniiformis O. et E. Danesch subsp. **benacensis** Reisigl

Flowering period
April and May.

Geographical distribution
Endemic to northern Italy.

Habitat
Poor grassland and scrubland, between 100 and 900 m, on dry to relatively wet, calcareous soil.

Status and conservation
Reported from the sub-alpine area where it is sometimes locally abundant.

Systematics
The taxonomic value of *Ophrys aurelia* Delforge, J. et P. Devillers-Terschuren, is controversial; this orchid, reported from Liguria and neighbouring areas, displays morphological characters very similar to those of *O. bertoloniiformis* subsp. *benacensis*, and in northern Tuscany the plants gradually begin to share more and more of the characters of *O. bertolonii*.

Description
It differs from the subsp. *bertoloniiformis* in having a more slender general habit, in the different colour of sepals and petals, in the shape of the lip, which is more elongate and almost straight seen from the side.

The sepals are more frequently pinkish, whitish, or green with pinkish tinge, more rarely green; the petals display various shades of pink, even very dark and tending to fuchsia, of ochre and of brown, often darker at the margins.

Friuli Venezia Giulia (PN), near Sacile.

Ophrys bombyliflora Link

Description

Small plant 5-25 cm tall. Lower leaves forming a rosette, relatively short, broadly lanceolate, with acute apex. Inflorescence lax, composed of 2-5 small flowers. Bracts quite broad, concave, shorter than the ovary. Sepals green, broadly ovate, concave, with rounded apex, spreading or reflexed. Petals very short, triangular, with obtuse or truncate apex, pubescent, greenish or yellowish green, much darker and brownish at the base. Lip trilobed, with the side lobes curving downwards, their bases extending forwards into 2 conical, hairy humps; mid-lobe hemispherical, with lateral margins strongly curved backwards, brownish and hairy in the apical portion, with a large, glabrous and lead-coloured area at the base; apical appendage greenish, broad and short, pointing backwards. Column short, obtuse at the apex

Flowering period

March to May.

Geographical distribution

Mediterranean, also present in the Canary Islands.

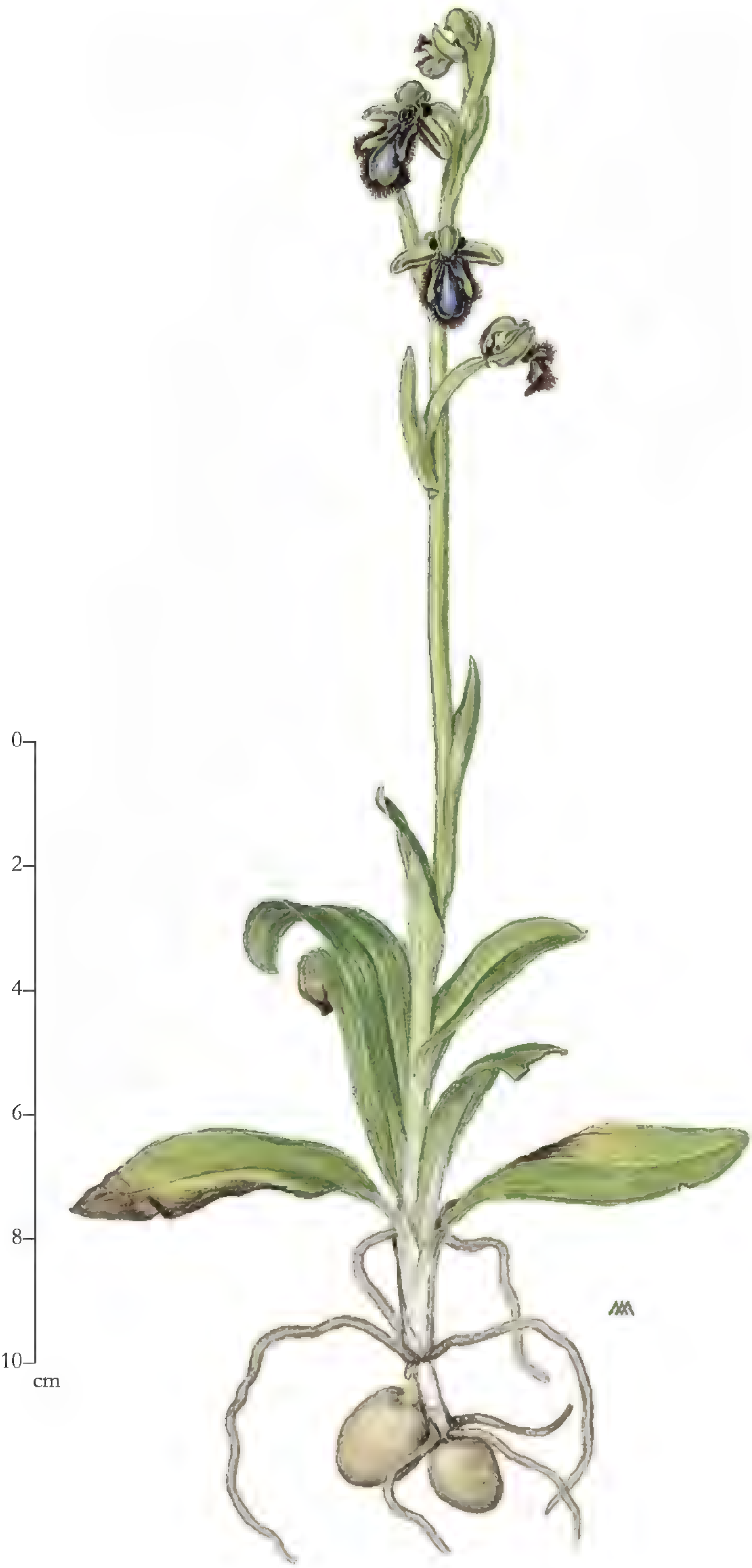
Habitat

Grassland, garrigue, and scrub, up to 600 m, on very dry to fairly damp, calcareous soil.

Status and conservation

Quite common in southern and central Italy and on the islands, absent from northern Italy except for Emilia Romagna.

Tuscany (GR), Montepescali, Poggio Romano.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Ophrys ciliata Bivona-Bernardi

Systematics

Synonyms: *Ophrys speculum* Link nom. ill.

Ophrys vernixia Brotero has priority for this orchid if the form from the SW portion of the Iberian Peninsula characterized by a more elongated lip is considered a subspecies or a variety.

Description

Plant 5-25 cm tall. Lower leaves forming a rosette, broadly lanceolate, with obtuse apex, the upper ones lanceolate, acute, sheathing the stem. Inflorescence lax, composed of 2-8 flowers relatively large compared with the dimensions of the plant. Bracts broad, concave, with obtuse apex, longer than ovaries. Lateral sepals spreading horizontally, concave, oblong-ovate, obtuse at the apex, greenish with two longitudinal reddish-brown stripes on the inner side; dorsal sepal strongly curved forwards, oblong, with rounded apex, greenish, tinged reddish-brown on the inner side. Petals short, truncate at the apex, curving backwards, pubescent, coloured dark purple-brown. Lip trilobed, with its margins entirely covered by dense reddish-brown hairs; mid-lobe ovate, slightly convex, with a very large, shiny, bluish area in the centre margined with greenish-yellow; side lobes much smaller, broadly lanceolate, spreading to suberect, with the inner side shiny, yellowish, reddish-brown at the base. Column hidden by the dorsal sepal,quite short, with a rounded tip.

Flowering period

March and April.

Geographical distribution

Mediterranean.

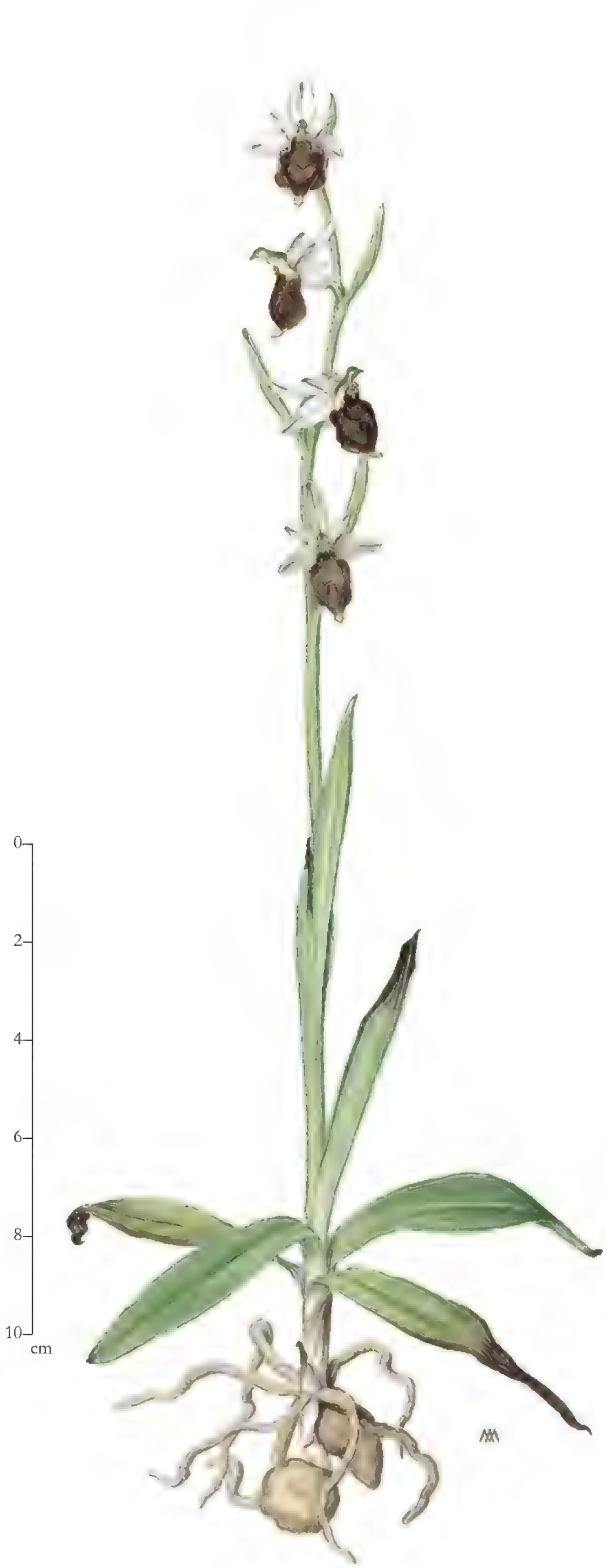
Habitat

Poor grassland, garrigue, and scrub, up to 1000 m, on very dry to somewhat damp, calcareous soil.

Status and conservation

Quite common in Sardinia and Sicily, very rare on the mainland.

Sicily (CL), Niscemi, Vallone Arcia.


0
2
4
6
8
10
cm

Ophrys crabronifera Mauri subsp. **crabronifera**

Geographical distribution

Endemic to central Italy.

Habitat

Poor grassland, garrigue, scrubland, coastal pinewoods, woodland margins, up to 1000 m, on dry to somewhat moist, alkaline or neutral soil.

Status and conservation

Most frequent along the Tyrrhenian coastal band (Tuscany, Latium and Campania), also present in Umbria, Marche, Abruzzo and Molise.

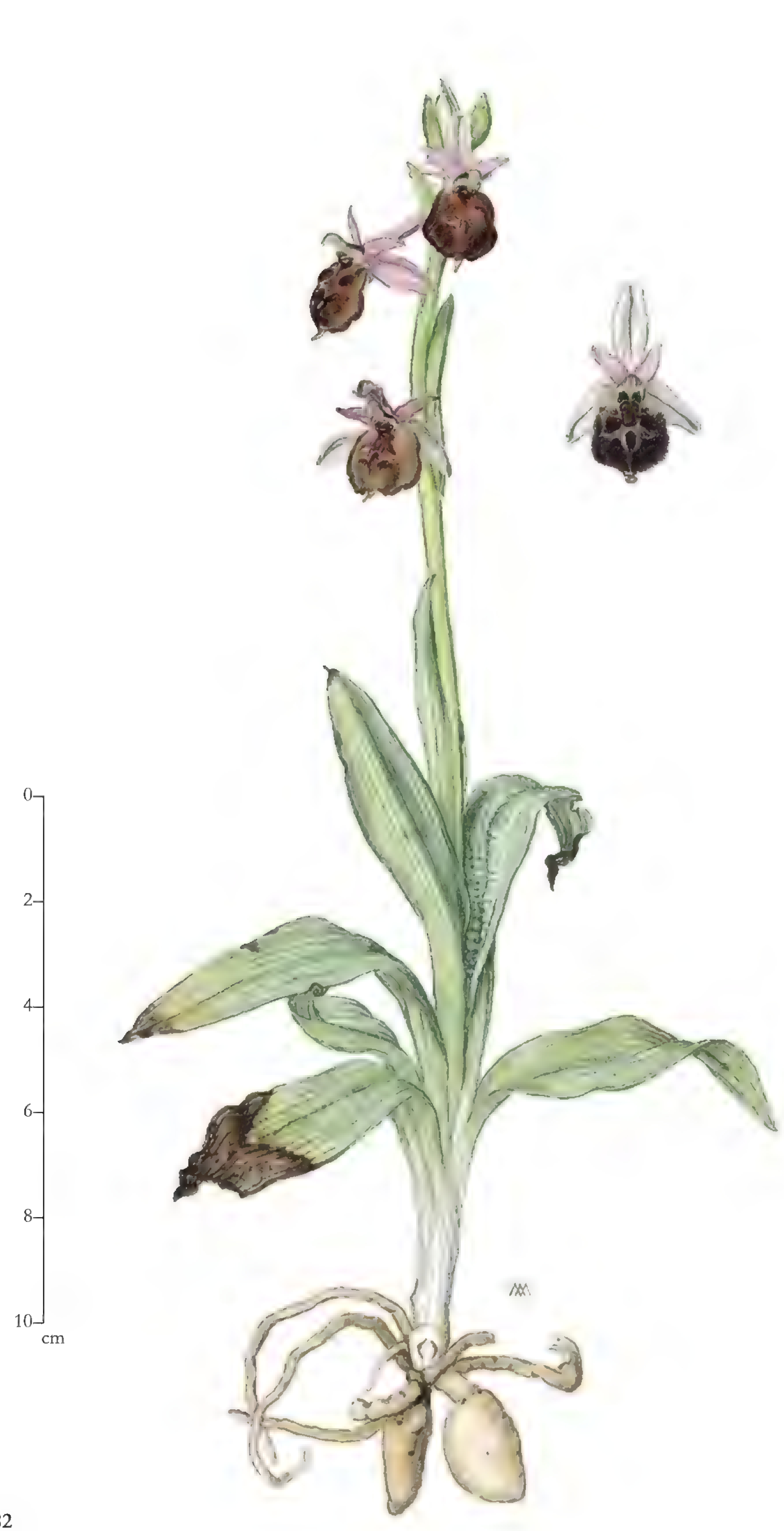
Description

Robust plant 20-50(60) cm tall. Leaves greyish-green, the lower ones oblong-lanceolate, forming a rosette, the upper erect and sheathing the stem. Inflorescence lax, elongate, composed of 3-8 flowers. Bracts large, concave, acute, longer than the ovaries. Sepals whitish or pinkish, less commonly greenish, with a green median vein, narrowly ovate, spreading or bent backwards. Petals lanceolate, whitish to purplish, more rarely greenish or brownish.. Lip large, entire or nearly so, convex, with basal humps absent or hardly prominent, the ground colour reddish-brown, dark brown, or yellowish brown, pubescent, surrounded by longer and paler hairs; speculum small, shiny grey, consisting of two small, symmetrical spots, which are sometimes joined by a cross-band; apical appendage yellowish-green, usually triangular and pointing forwards. Column ending in a short, obtuse tip.

Flowering period

From the end of March to mid May.

Tuscany (GR), M. Argentario, Val di Prato.


0
2
4
6
8
10
cm

Ophrys crabronifera Mauri subsp. **sundermannii** (Soó) Del Prete

Systematics

Synonyms: *Ophrys fuciflora* (F.W. Schmidt) Moench subsp. *pollinensis* E. Nelson; *O. biscutella* O. et E. Danesch.

The taxonomic position of this orchid is uncertain because it bears intermediate characters between *O. crabronifera* and *O. argolica* H. Fleischmann (endemic to southern Greece), and maybe closer to the latter than to the former.

Description

It differs from *Ophrys crabronifera* subsp. *crabronifera* in having a less convex lip, smaller apical appendage, larger (on the average) speculum, and stigmatic cavity narrower at the base, sepals and petals white to deep purple, very seldom greenish.

Flowering period

From the end of March to mid May.

Geographical distribution

Southern Italy and the island of Korcula (Croatia).

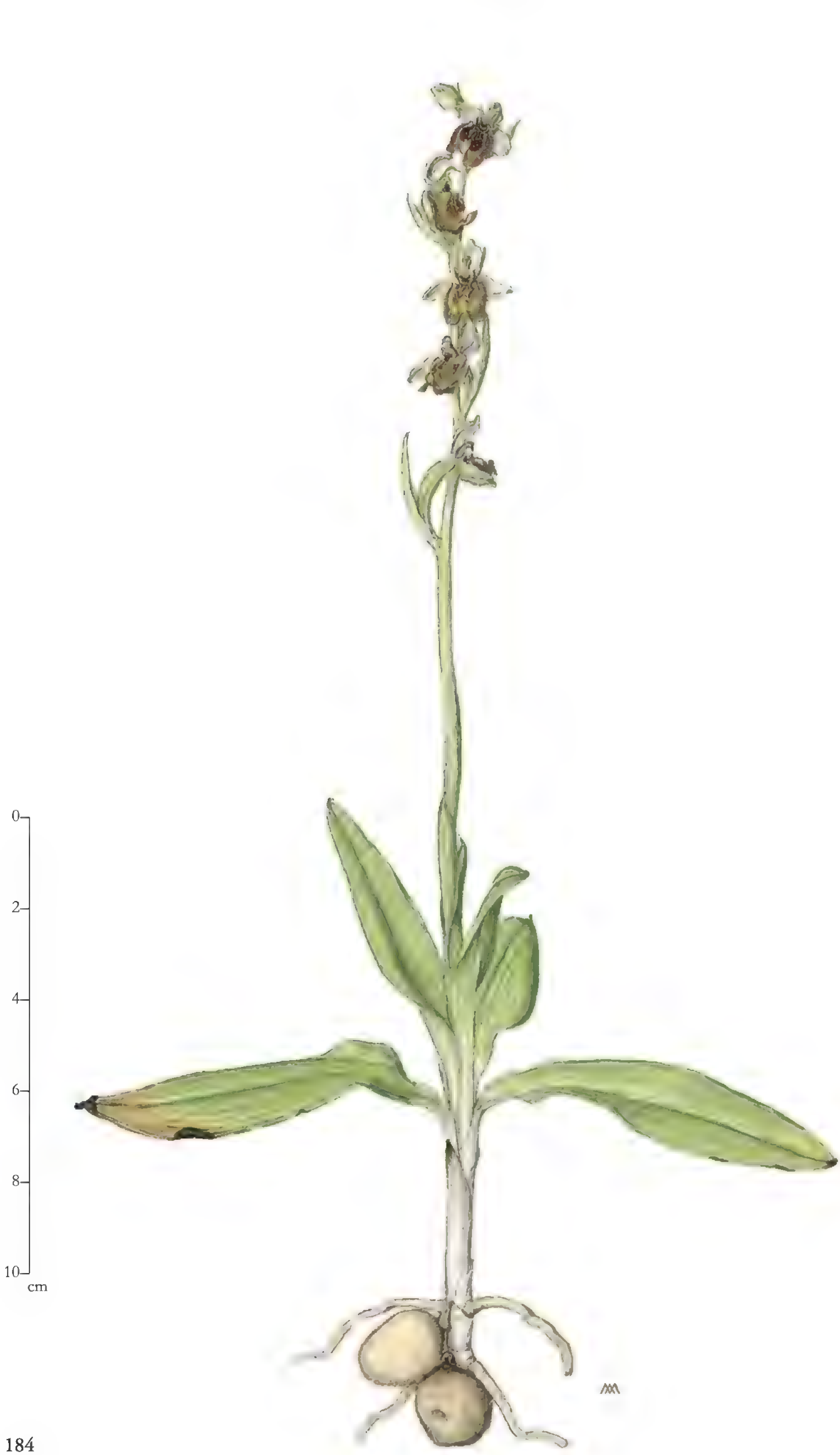
Habitat

Poor grassland, garrigue, scrubland, open woodland, up to 1300 m, mostly on calcareous, dry to somewhat moist soil.

Status and conservation

Reported only in Calabria, Basilicata and Apulia, local but sometimes abundant. Records from Campania need confirmation.

Apulia (FG), Gargano Peninsula, M. S. Angelo, Bosco Quarto, m 700.


0
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10
cm

Ophrys discors Bianca in Gussone

Geographical distribution

Endemic to Sicily.

Habitat

Poor grassland, garrigue, open pinewoods, up to 700 m, on calcareous, usually dry soil.

Status and conservation

Reported from eastern (surroundings of Catania, Ragusa and Syracuse) and western Sicily (surroundings of Trapani and Palermo).

Systematics

Synonyms: *Ophrys biancae* (Todaro) Macchiati.

Species of uncertain taxonomic value, very similar to *O. bornmuelleri* M. Schulze.

Description

The flowers of this orchid are relatively small. The sepals are whitish or pinkish, sometimes tinged green. The petals are small, triangular, of the same colour as sepals or also yellowish. The lip is entire, velvety, reddish-brown in the centre, paler and hairy at the margins, with basal humps usually small; the speculum is represented by a relatively small shiny spot, greyish or violaceous, often H-shaped or similar to a butterfly, surrounded by a whitish margin; the apical appendage is quite large, yellowish-green, rhomboid or tridentate, curving upwards.

Flowering period

March and April.

Sicily (RG), pine-wood of Vittoria.

0
2
4
6
8
10
cm
b
a

Ophrys exaltata Tenore

Systematics

Synonyms: *Ophrys sphegodes* Miller subsp. *sicula* E. Nelson ex Soó.

The taxonomic position of *O. panormitana* (Todaro) Soó is still controversial; it is considered by some authors to be a form of *O. exaltata* with a less convex and more deeply trilobed lip.

Description

Plant 20-50 cm tall. Inflorescence elongate, more or less lax, composed of 4-15 relatively large flowers. Bracts lanceolate, concave, longer than ovary, the lower ones exceeding the whole flower in length. Sepals usually spreading, ovate-lanceolate, variably coloured, whitish to pinkish, sometimes purplish, rarely pale green or yellowish-green, always with obvious longitudinal green veins. Petals glabrous, oblong, relatively long and narrow, with straight or wavy margins, variably coloured, always darker than sepals. Lip reddish-brown, about as long as sepals, entire or slightly trilobed, strongly convex, with basal protuberances small or absent, and apical appendage very small; speculum usually simple, H- or X-shaped, shiny, greyish or violaceous. Column ending in a short, acute tip.

The subspecies *archipelagi* (Gölz et H.R. Reinhard) Del Prete has a more slender habit, smaller flowers on average, and wider petals (fig. b).

Flowering period

March and April.

Geographical distribution

Southern Italy and island of Korcula (Croatia).

Habitat

Poor grassland, garrigue, open woodland, and stony areas, up to 1200 m, on dry to somewhat moist, calcareous to slightly acidic soil.

Status and conservation

This orchid is not a very common one; *O. exaltata* subsp. *exaltata* is present in Sicily and Calabria, while *O. exaltata* subsp. *archipelagi* is found in Basilicata, Apulia, and the island of Korcula.

a. Sicily (RG), pine-wood of Vittoria.
b. Apulia (FG), Gargano Peninsula, near Peschici, Valle Sfinale.

b
0
2
4
6
8
10
cm
a

Ophrys fuciflora (F.W. Schmidt) Moench subsp. **fuciflora**

Systematics

A very variable and widespread species, with a large number of varieties, subspecies, and closely related taxa often given specific rank. For this reason, both the taxonomic and the geographic delimitation of *Ophrys fuciflora* are unresolved.

O. fuciflora subsp. *candica* E. Nelson ex Soó, reported only for Apulia in the Italian territory, differs from the typical subspecies in the speculum of the lip, which consists of a square patch of brownish-violet, either uniform or delicately marbled, surrounded by a whitish margin (fig. 108).

The name *O. holoserica* (N.L. Burman) Greuter, which has replaced that of *O. fuciflora* in recent years, is likely a synonym of *O. apifera* Hudson.

Description

Plant (10)15-40(50) cm tall. Leaves light green with a greyish tinge, broadly lanceolate, obtuse, the upper ones narrower, acute, erect, sheathing the base of the stem. Inflorescence usually lax and elongate, composed of 2-10(12) relatively large flowers. Bracts much longer than the ovary. Sepals spreading or bent backwards, concave, ovate-oblong, obtuse or rounded at the apex, from white to deep purple, rarely green, often with a green longitudinal vein. Petals less than half as long as the sepals, triangular, enlarged at the base, pubescent, variable in colour: brown, yellowish or white, but more often in various shades of pink. Lip entire, convex, velvety, reddish-brown to dark brown, with glabrous markings near the base very variable in size and in colour, often similar to an arabesque; basal protuberances conical, more or less prominent, rarely absent, usually paler and glabrous on the inner side; apical appendage yellowish-green, quite broad, pointing forwards and sometimes bent upwards, obtuse or toothed at the apex. Column with a short and acute tip.

Flowering period

End of March to June.

Geographical distribution

Its range is difficult to define because of possible confusion with similar orchids; in its more typical form it is probably limited to central and southern Europe and southern England.

Habitat

Poor grassland, garrigue, open scub and wood, up to 1200 m, usually on calcareous, dry to moderately humid soil.

Status and conservation

Widespread and often abundant throughout Italy.

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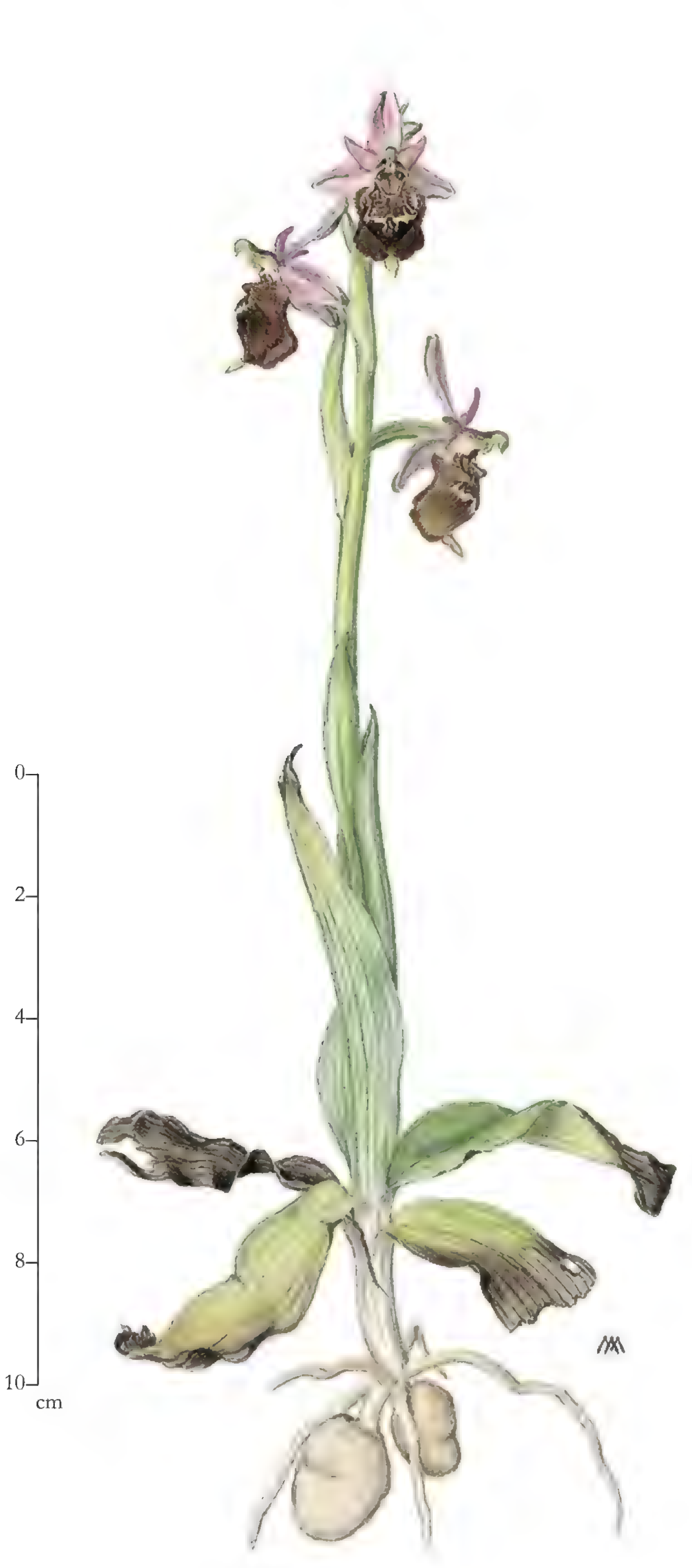
a. Tuscany (PO), near Schignano, m 300.
b. Apulia (LE), Salento, Bosco di Rauccio.


0
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cm

Ophrys fuciflora (F.W. Schmidt) Moench subsp. **apulica** O. et E. Danesch

Habitat

Poor grassland, garrigue, open woodland and scrub, up to 900 m, usually on dry, calcareous soil.

Status and conservation

Found in Apulia, Molise and Abruzzo; large-flowered specimens ascribed to subsp. *apulica* are reported also from neighbouring regions.

Systematics

A subspecies of doubtful taxonomic value. Around the margins of its range the plants gradually grade into the typical subspecies.

Description

It differs from subsp. *fuciflora* in the larger size of the flowers and in the length of the petals; it differs from subsp. *chestermanii* (J.J. Wood) Blatt et Wirthin having a paler and more convex lip, and a larger speculum.

The petals are more than half as long as the sepals. The lip is strongly convex, especially lengthwise; it can be as long as 18 mm and as broad as 22 mm (extended).

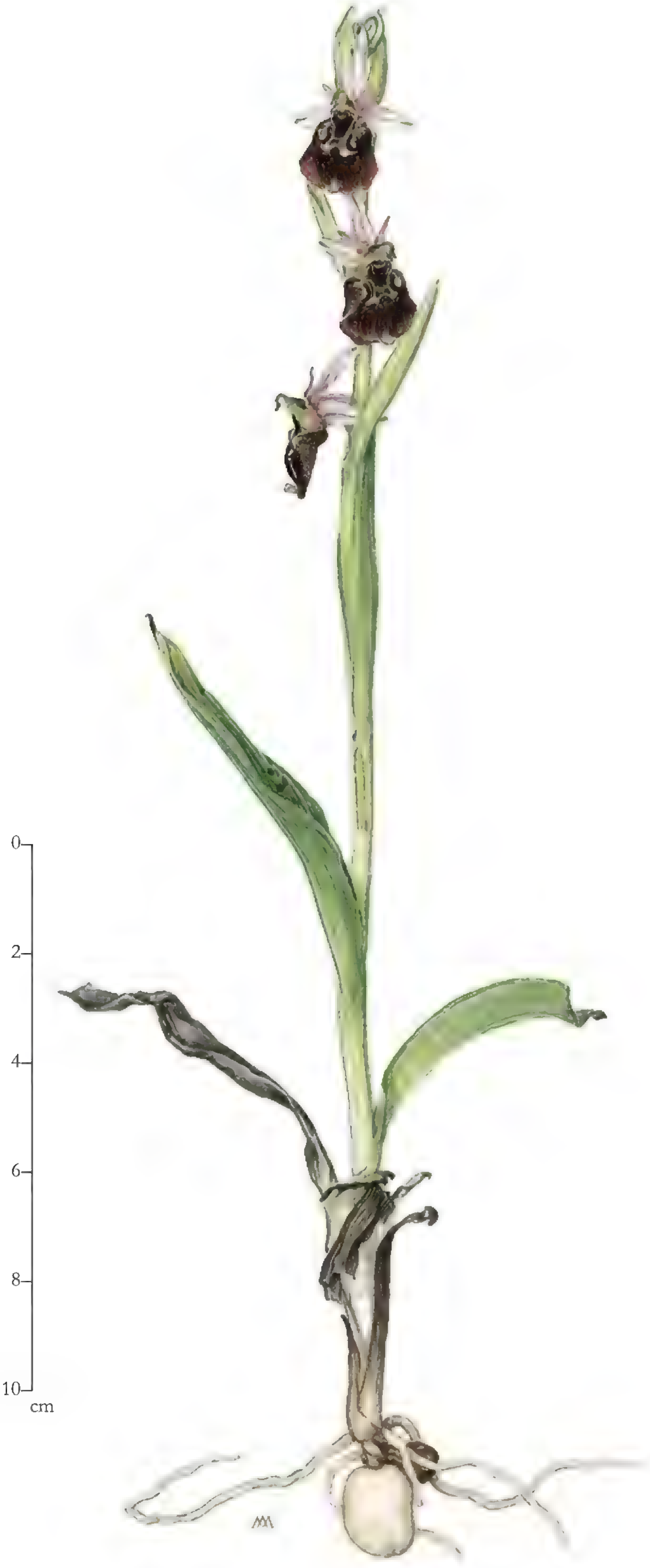
Flowering period

From the beginning of April to the beginning of May.

Geographical distribution

Endemic to southern and central Italy.

Apulia (FG), Gargano Peninsula, M. S. Angelo, loc. S. Barnaba, m 650.


0
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4
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10
cm

Ophrys fuciflora (F.W. Schmidt) Moench
subsp. **chestermanii** (J.J. Wood) Blatt et Wirth

Status and conservation

Restricted to southern Sardinia, mainly in the Iglesiente and Ogliastra areas.

Description

This orchid is characterized by its large flowers and by the colour of the lip.

The inflorescence is composed of a small number of flowers (2-6). The sepals tend to bend backwards. The petals are relatively narrow. The lip can be as long as 18 mm and as wide as 23 mm, it is slightly convex, quite dark, brownish or blackish-brown, somewhat paler towards the front margin, with basal humps hardly prominent; at the base of the lip there is a relatively small H- or W-shaped spot, shiny, with metallic hues, occasionally surrounded by a narrow, pale margin.

Flowering period

From the end of March to mid May.

Geographical distribution

Endemic to Sardinia.

Habitat

Open scrub, glades and woodland margins, between 400 and 600 m, on cool, calcareous soil.

Sardinia (CA), Domusnovas.

c
a
b
d

Ophrys fusca Link (sensu lato)

Systematics

This orchid has recently been split by certain authors into a large number of "species" on the basis of small morphological and phenological differences or according to the pollinating insects. As often happens when dealing with orchids, the verification in the field reveals a very different situation from that presented in some popular manuals. In fact, the presence of numerous intermediate forms makes it impossible to separate these proposed "species". Only a study based on molecular markers will be able to give a definitive answer to this problem.

In this book we have recognized only one species, *Ophrys fusca*, with a wide distribution throughout Italy, and one endemic of western Sicily, *O. pallida*, to which should maybe be added *O. mirabilis* Geniez et Melki (not illustrated here) recently described from a small area in central Sicily. Certain populations from Sardinia, characterized by relatively large flowers with a brilliant blue speculum and a reddish underside to the lip (fig. d), are assigned to subspecies *iricolor* (Desfontaines) K. Richter, which some authors consider a separate species (*O. iricolor* Desfontaines; *O. eleonorae* J. et P. Devillers-Terschuren). Even in this case the presence of intermediate forms render this distinction debatable.

Description

Very variable plant, 10-30 cm tall. Lower leaves usually quite short and broad, forming a rosette. Inflorescence lax, composed of 2-8 flowers, rarely more, quite variable in size. Bracts broad, obtuse, equalling or slightly exceeding the ovary. Sepals green or yellowish-green, the laterals spreading, with obtuse apex, the dorsal curved forwards, with rounded apex. Petals about 2/3 the length of the sepals, narrow, oblong, the margins more or less undulate, the apex obtuse or truncate, the colour greenish-yellow to greenish-brown. Lip elongate, slightly convex, trilobed, with mid-lobe slightly bilobed; velvety, reddish-brown to blackish-brown, often with a narrow, glabrous, yellowish margin; speculum quite large, bilobed, greyish to bluish, sometimes with darker dots and streaks. Column short, with obtuse apex.

Flowering period

From the end of February to mid June.

Geographical distribution

Mediterranean-Atlantic.

Habitat

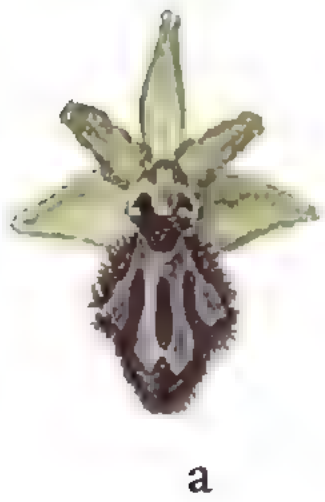
Poor grassland, garrigue, open scrubland, stony soils, up to 1400 m, on calcareous soil.

Status and conservation

Found in all the regions of southern and central Italy, on the islands, in Liguria, and in Emilia Romagna; recorded also from Lombardy and Piedmont in a single location each; more common and frequent in the south, gradually less common moving northwards.

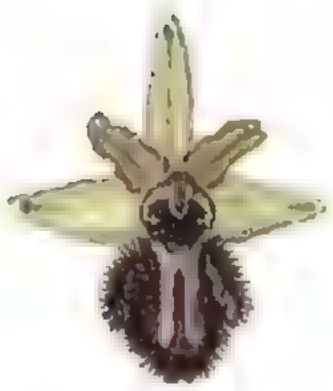
---

a. Basilicata (MT), loc. Belvedere, near Matera; b. Tuscany (GR), pine-wood near Castiglione della Pescaia;
c. Tuscany (FI), Poggio Conca, near Vaglia, m 600, d. Sardinia (CA), Cagliari, Colle Tuvixeddu.



a

b



d

c

a

Ophrys incubacea Bianca

Systematics

Synonyms: *Ophrys atrata* Lindley; *O. sphegodes* Miller subsp. *atrata* (Lindley) E. Meyer.

Single specimens or whole populations with intermediate characters between *O. incubacea* and *O. sphegodes* are often found.

Description

It differs from *Ophrys sphegodes* above all in having the basal protuberances of the lip well-developed (up to 4 mm high) and shiny on the inner sides; moreover the lip is usually darker, more elongate, with longer hairs at the margin; the speculum is often shiny blue, a hue which is seldom found in *O. sphegodes*.

Flowering period

The same as in *O. sphegodes*.

Geographical distribution

Western and central Mediterranean, from Portugal to Albania; not recorded in North Africa.

Habitat

The same as in *O. sphegodes*.

Status and conservation

Present in all the regions of central and southern Italy, in the islands and in Liguria; it is definitely more abundant in the South.

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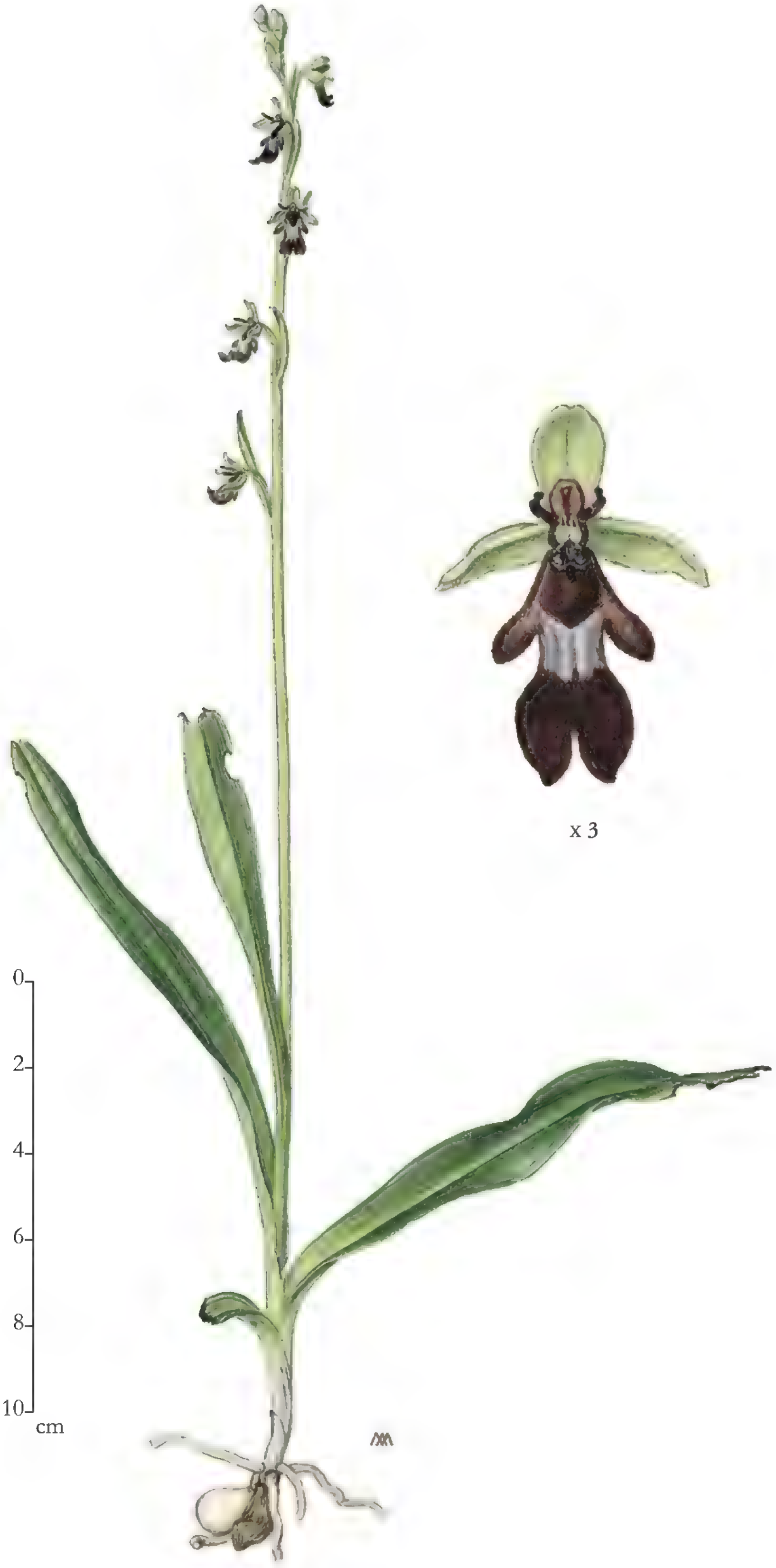
a. Sardinia (CA), Cagliari, Colle Tuvixeddu; b. Apulia (FG); Gargano Peninsula, M. S. Angelo, loc. Gentile, m 400;
c. Tuscany (GR), near Alberese; d. Tuscany (PO), near Cerreto.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cm

Ophrys insectifera Linnaeus

Habitat

Grassland and open woodland, up to 2050 m, on dry to moist, calcareous soil.

Status and conservation

Quite common in northern Italy, progressively less so in the centre, very rare to the south, absent from the islands and from Apulia.

Description

Slender plant 15-60 cm tall. Leaves light green with a greyish shade, lanceolate to oblong, not forming a rosette, the upper ones erect and sheathing the stem. Inflorescence lax, elongate, composed of 3-15 flowers. Bracts much longer than the ovary. Sepals green, oblong, obtuse at the apex, somewhat concave, spreading. Petals linear, very narrow, shorter than sepals, pubescent, dark violet-brown. Lip velvety, reddish brown, sometimes yellow margined, horizontally crossed in the middle by a large glabrous or even shining, bluish-grey band; deeply trilobed, with side lobes small, narrow, divergent, and mid-lobe much longer, expanding towards the bilobed apex. Column very short, with rounded apex.

Flowering period

From the end of April to mid July.

Geographical distribution

European.

Tuscany (FI), Pratolino, pine-wood along the road to M. Morello, m 530.

0
2
4
6
8
10
cm

Ophrys lacaitae Lojacono

Systematics

Synonyms: *Ophrys fuciflora* (F.W. Schmidt) Moench subsp. *lacaitae* (Lojacono) Soó; *O. oxyrrhynchos* Todaro subsp. *lacaitae* (Lojacono) Del Prete. This orchid is closely allied to *Ophrys oxyrrhynchos* (page 209) and might be considered a subspecies of the same.

Description

Plant 10-40 cm tall. Leaves light green, oblong-lanceolate, usually withered when the plant is in flower. Inflorescence at first dense, than lax and elongate, composed of 3-10 relatively large flowers. Bracts broadly lanceolate, concave, yellowish-green, longer than the ovary, the lower ones exceeding the flowers. Sepals spreading, ovate-oblong, obtuse, whitish-green or yellowish-green, with a green longitudinal vein. Petals whitish, pubescent, very short, triangular or heart-shaped. Lip broadly trapezoid, convex in the centre, flattened or slightly concave at the margins, hairy at the base; basal protuberances hardly prominent; colour mostly yellow, with a relatively small, reddish-brown, central area surrounding a small, H-shaped, violaceous, shining spot margined with white; apical appendage yellowish, pointing upwards and forwards, quite large, often fusiform, acute, obtuse, or toothed at the apex. Column short, ending in a short tip.

Flowering period

April to June.

Geographical distribution

Endemic to Sicily and to central and southern Italy.

Habitat

Poor grassland, garrigue, open scrub, up to 1300 m, usually on dry, calcareous soil.

Status and conservation

A relatively rare species, which is found in southern Latium, Molise, southern Italy, and Sicily.

Latium (FR), Esperia, Passo Bastia, m 500.

0
2
4
6
8
10
cm

Ophrys lunulata Parlatore

Description

Slender plant 15-40 cm tall. Lower leaves oblong-lanceolate, forming a rosette, the upper ones erect and sheathing the stem. Inflorescence lax, elongate, composed of 4-10 flowers. Bracts much longer than the ovaries, the lower exceeding the flowers. Sepals whitish, pinkish or reddish, with a green median vein, narrowly ovate, the laterals spreading or pointing downwards, the dorsal curving forwards. Petals pink, linear, rather long and narrow. Lip deeply trilobed; mid-lobe with the sides strongly curving backwards so that it appears slender and elongate, reddish brown, with a yellowish to pale brown margin, and a relatively small, central, shiny, crescent-shaped marking, whose colour ranges from bluish grey to reddish; lateral lobes hairy outside, with small humps at the base; apical appendage usually triangular, rather large, greenish yellow. Column forming a right angle with the lip, ending in a quite long and acute tip.

Flowering period

March and April.

Geographical distribution

Apparently endemic to Sicily.

Habitat

Poor grassland, garrigue, open woodland, and stony areas, up to 1300 m, on dry to somewhat moist, calcareous soil.

Status and conservation

Present with certainty only in Sicily, where it is not common; all other reports (Sardinia, Calabria, Malta) are dubious and need confirmation.

It is listed as "vulnerable" in the "red book" of Italian plants (Conti, Manzi & Pedrotti, 1992).

Sicily (RG), pine-wood of Vittoria.

0
2
4
6
8
10
cm

x 2

a

b

c

Ophrys lutea Cavanilles

Description

Plant (5)10-30(35) cm tall. Lower leaves usually quite short and broad, forming a rosette. Inflorescence lax, composed of 2-7 flowers. Bracts broad, obtuse, yellowish-green, equalling or slightly exceeding the ovary. Sepals yellowish-green, the l laterals spreading or slightly curving forwards, with obtuse apex, the dorsal strongly curved forwards, with rounded apex. Petals 1/2 to 2/3 the length of the sepals, narrow, oblong, the margins more or less undulate, the apex obtuse or truncate, the colour yellowish to greenish. Lip broadly ovate, concave at the base, slightly convex in the centre, flattish to slightly concave at the margins, trilobed, with mid-lobe longer and slightly bilobed; velvety, light brown to dark brown in the centre, with a wide, glabrous, bright yellow margin; speculum quite large, bilobed, sometimes with the shape of a butterfly, greyish to bluish, sometimes marbled. Column short, with obtuse apex.

The variety *minor* (Todaro) Gussone [= *O. lutea* subsp. *minor* (Todaro) O. et E. Danesch; *O. lutea* subsp. *murbeckii* Soó; *O. sicula* Tineo; *O. galilaea* Fleischmann et Bornmann)] has smaller flowers with the darker colour of the lip centre extending and bifurcating forwards (fig. a).

In the variety *melena* (Renz) E. Nelson (= *O. lutea* subsp. *melena* Renz) the lip is almost entirely brownish except for the speculum, the wide yellow margin being absent or very reduced (fig. c).

Flowering period

From the end of February to the end of May.

Geographical distribution

Mediterranean.

Habitat

Poor grassland, garrigue, open scrubland, up to 1400 m, on calcareous soil.

Status and conservation

Found in all the regions of southern Italy, in central Italy except Umbria and Marche, on the islands, and in Liguria; more common and frequent on the islands and in the south, gradually less common moving northwards.

While the variety *minor* is found throughout the Italian range of the species, the varieties *lutea* and *melena* are only found on the islands and in southern Italy.

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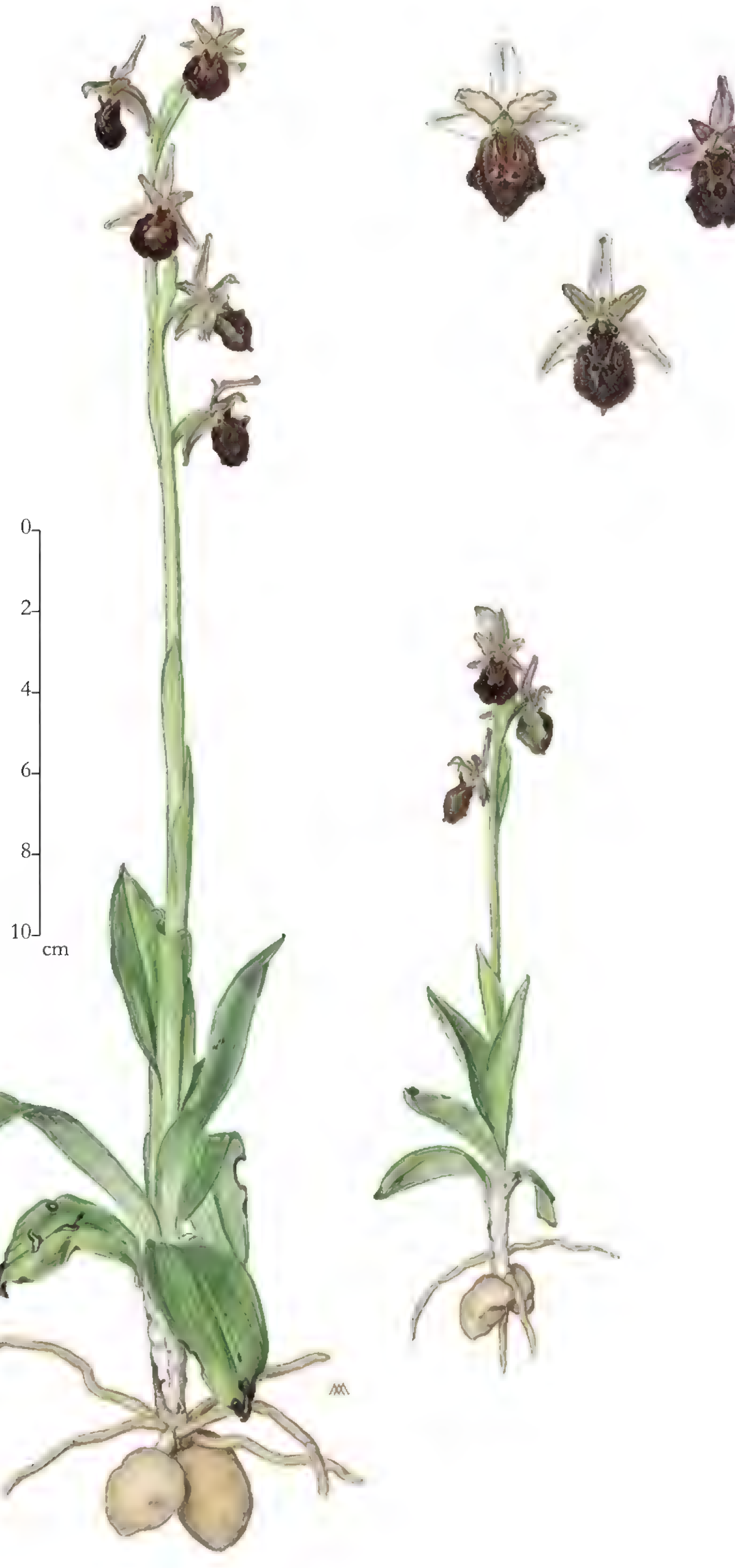
a. Tuscany (GR), Maremma Natural Park; b. Sicily (RG), pine-wood of Vittoria; c. Apulia (FG), Gargano Peninsula, Valle Sfinale, near Peschici.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cm

Ophrys morisii (Martelli) Soó

Habitat

Grassland, garrigue, scrub and open woods, up to 1000 m, on various substrates.

Status and conservation

This orchid is quite widespread and abundant on Sardinia.

Systematics

Synonyms: *Ophrys aranifera* Hudson var. morisii Martelli; *O. exaltata* subsp. *morisii* (Martelli) Del Prete.

The taxonomic position of this extremely variable plant, reported only from Sardinia and Corsica, is anything but clear. On one hand its flowers tend to assume the characteristics of those of *Ophrys crabronifera* (species not reported from Sardinia) and on the other hand they tend to gradate towards those of *O. sphegodes* subsp. praecox. Flowers with intermediate characteristics are often very similar to those of *O. tyrrhena* (see also the illustrations in Scrugli, 1990, and Giotta & Piccitto, 1990). To simplify the situation one could say that *O. morisii* is identifiable only on a geographical basis.

Flowering period

From the end of February to mid May.

Geographical distribution

Sardinia and Corsica.

Sardinia (NU), Laconi, m 700.

b
a

Ophrys oxyrrhynchos Todaro

Geographical distribution

Endemic to Sicily and southern Italy.

Habitat

Poor grassland, garrigue, open scrub, up to 1300 m, usually on dry, calcareous soil.

Status and conservation

A rare species, which is found in Sicily, Calabria, Basilicata and Apulia.

Systematics

Synonyms: *Ophrys fuciflora* (F.W. Schmidt) Moench subsp. *oxyrrhynchos* (Todaro) Soó.

Ophrys fuciflora (F.W. Schmidt) Moench subsp. *celiensis O.* et E. Danesch seems to be a synonym of, or at the most a variety of *O. oxyrrhynchos*.

Description

Similar to *Ophrys lacaitae*, from which it differs in having a different flower colour. The sepals are sometimes tinged with pink or with red. The colour of the petals varies from almost white to purple. The ground colour of the lip is yellowish-brown to reddish-brown, the speculum is usually larger and more complicated, and the colour of the apical appendage varies from yellow to reddish-brown. Moreover, the tip of the column is often distinctly longer.

Flowering period

From the end of March to mid May.

---

a. Sicily (CL), Niscemi, Vallone Arcia; b. Apulia (TA), Martina Franca.

x 2

Ophrys pallida Rafinesque

Habitat

Poor grassland, garrigue, open scrubland and woodland, stony areas, up to 1100 m, on calcareous soil.

Status and conservation

A rare and local species only found in western Sicily; old records from Sardinia are mistaken.

Description

Plant rather small, 10-25 cm tall. Inflorescence lax, composed of 2-5(6) small flowers. Bracts concave, longer than the ovaries. Sepals whitish, pale green, or very pale pink, ovate, concave, the laterals spreading, the median curving forwards. Petals tongue-shaped, shorter and much narrower than sepals, coloured yellowish-green to olive-green. The lip is rather abruptly bent near the base and then curving backwards, shallowly trilobed, the side lobes small and folded backwards; the surface is velvety, the colour blackish-brown to reddish-brown, and the speculum consists of two large, basal patches pale grey to bluish divided by a deep groove.

Flowering period

March and April.

Geographical distribution

Western Sicily and North Africa (Algeria and Tunisia).

Sicily (PA), foot of M. la Pizzuta.

x 2

Ophrys scolopax Cavanilles
subsp. **cornuta** (Steven in von Bieberstein) E.G. Camus

Status and conservation

A rare orchid in Italy, reported only from the Gargano Peninsula, which represents the western limit of its range.

Systematics

Synonyms: *Ophrys cornuta* Steven in von Bieberstein; *O. fuciflora* (F.W.Schmidt) Moench subsp. *cornuta* (Steven in von Bieberstein) Sundermann; *O. oestrifera* Steven in von Bieberstein.

Description

It differs from subspecies *scolopax* in the length of the side lobes of the lip, which are 6-12 mm long and also quite slender.

Flowering period

From mid April to the beginning of June.

Geographical distribution

South-Eastern Europe and Turkey.

Habitat

Poor grassland, garrigue, open woodland and srcub, up to 500 m, on dry, calcareous soil.

Apulia (FG), Gargano Peninsula, Peschici, pine-wood near Coppa del Fornaro.

0
2
4
6
8
10
cm

Systematics

Ophrys sphegodes subsp. *praecox* presents intermediate morphological characteristics between *O. sphegodes*

4
6
8
10
cm

Ophrys tarentina Gölz et H.R. Reinhard

Flowering period
From mid April to mid May.

Geographical distribution
Endemic to southern Italy.

Habitat
Poor grassland, garrigue and scrubland, up to 600 m, on calcareous, dry soil.

Status and conservation
Reported only in southern Apulia, Basilicata and Calabria; local but sometimes abundant.

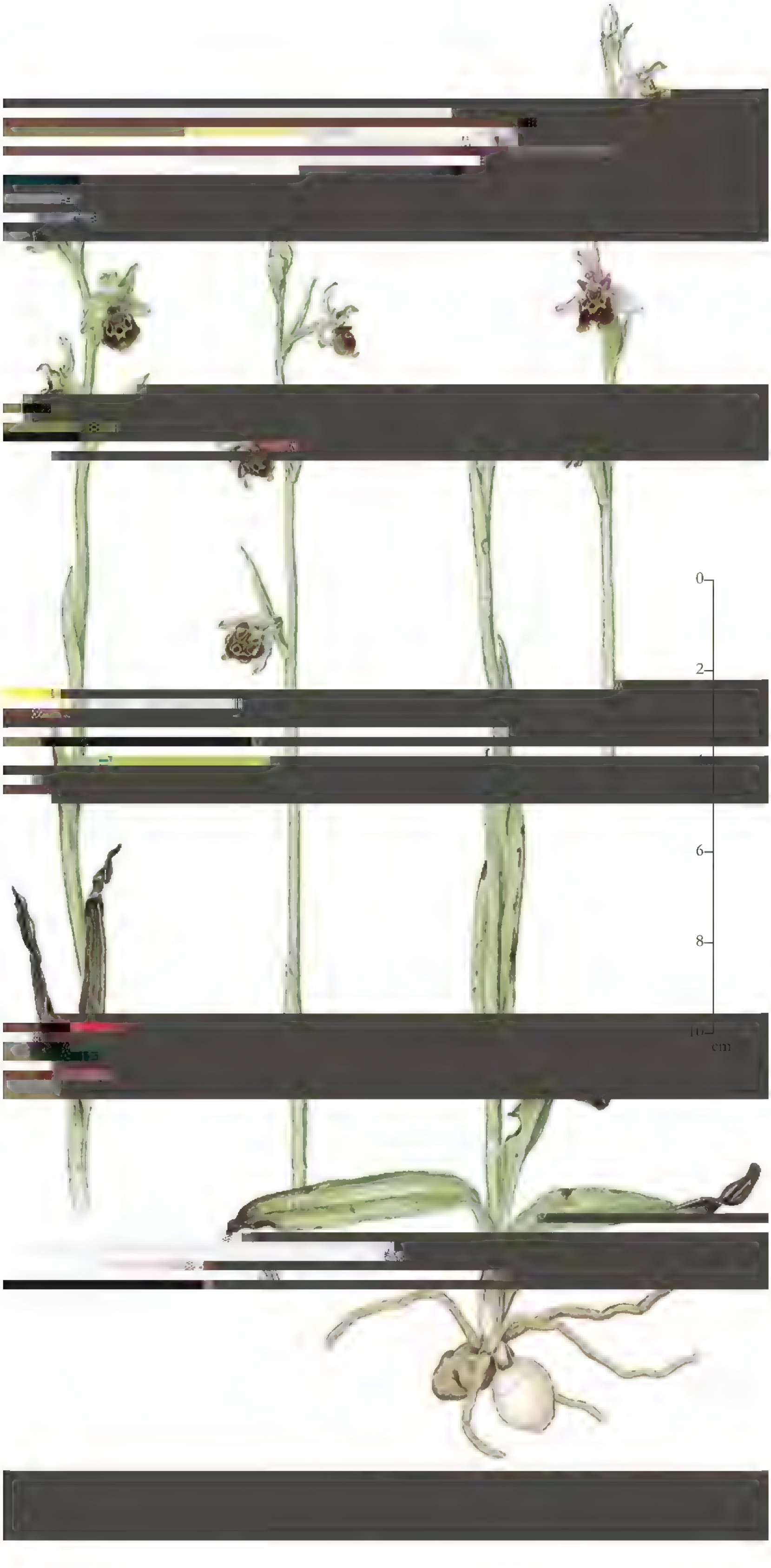
Systematics
The taxonomic position of this orchid is uncertain. It can often be observed in populations which present all the intermediate forms between *Ophrys bertolonii* on one hand and *O. sphegodes* and *O. incubacea* on the other.

The specimens illustrated here are not the most "typical", but faithfully represent the situation one finds in the field.

Description
The flowers have spreading, greenish sepals. The petals are oblong, obtuse, usually greenish or yellowish-green, more rarely ochre. The lip is entire or obscurely trilobed, elongate, velvety, reddish-brown to dark brown, surrounded by a fringe of longer and paler hairs, with basal humps absent or very small; the speculum is grey or violaceous, shiny, its shape very variable: it can be represented by two small, symmetrical, central spots, or be horseshoe-shaped, more or less elongate, or form a quite elongate H or X; the apical appendage is very small and triangular.

Apulia (TA), Martina Franca.

a
b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cm

Ophrys tetraloniae W.P. Teschner

Systematics

Ophrys tetraloniae and *O. fuciflora* (F.W. Schmidt) Moench subsp. *elatior* (Gumprecht ex Paulus) R. Engel et Quentin are very similar and are often regarded as synonyms. In this same group is sometimes included also *O. fuciflora* subsp. *gracilis* Büel, O. et E. Danesch, an orchid which Büel himself later regarded as a synonym of *O. fuciflora* (Rossi et al., 1990).

Description

It differs from *Ophrys fuciflora* in having a much slenderer habit, much smaller flowers, and a later flowering period (up to September in the populations from central Europe).

The leaves are withered when the plant is in flower. The lip is usually strongly convex, with the basal protuberances hardly prominent. The colour of the sepals is variable: in northern Italy it is more commonly white or pinkish, while in central Italy it is whitish or more frequently green, a colour which is not common in *O. fuciflora*.

Flowering period

From mid June to the end of July, 2 to 4 weeks later than *O. fuciflora*.

Geographical distribution

The range of this orchid is difficult to define because of possible confusion with other taxa. It is certainly present in Germany, France, Switzerland, Istria, and Italy.

Habitat

Poor grassland, garrigue, open scub, up to 1000 m, usually on dry, calcareous soil.

Status and conservation

Not a very common plant in Italy, but of uncertain range because of the numerous reports of *Ophrys fuciflora* "*gracilis*" in the central and southern regions. It is reported from Campania, Latium, Abruzzo, Marche, Emilia Romagna, Veneto, and Trentino.

---

a. Latium (LT), M.ti Aurunci, M. Lapillo, 750 m; b. Trentino, Riva del Garda, M. Brione, 200 m.

c
d
a
b
a

Ophrys tyrrhena Gölz et H.R. Reinhard

Systematics

Synonyms: *Ophrys exaltata* subsp. *tyrrhena* (Gölz et H.R. Reinhard) Del Prete.

Description

Plant up to 35(40) cm tall. Bracts exceeding the ovary, the lower ones exceeding the whole flower. Inflorescence usually lax, composed of 3-10(15) very variable flowers. Sepals slightly arched forwards, usually forming between them angles of about 120°, more frequently pinkish, but also whitish or purplish, more rarely greenish. Petals also very variable in colour, always darker than sepals, with margins often ciliate and undulate, sometimes darker than the centre. Lip entire or weakly trilobed, convex reddish-brown to deep brown, with basal humps absent or very small; speculum variable in shape and size; apical appendage narrow acute or more rarely toothed at the apex. Column ending in a short, more or less acute apex.

Flowering period

March and April.

Geographical distribution

Northern portion of the Italian Tyrrhenian coast, from Liguria to southern Latium.

Habitat

Poor grassland, garrigue, open scrub and pinewoods, up to 500 m, on calcareous or sandy, usually dry soil.

Status and conservation

Limited to the coastal area, rarely found further inland; very local and infrequent but can form populations of numerous plants.

---

a. Tuscany (GR), pine-wood Punta Ala; b. Tuscany (GR), M. Argentario, Val di Prato; c. Tuscany (GR), M. Calvo di Ravi, m 400; d. Tuscany (GR), near Sticciano, m 300.

ORCHIS Linnaeus (sensu lato)

It has recently been proposed on the basis of studies on gene spacers (ITS) to split the genus *Orchis*, as it has been agreed upon up to now, into three different genera (Pridgeon et al., 1997; Bateman et al., 1997). However, in this book the traditional nomenclature has been maintained because the technique used in the above studies has been found to be unsuitable in studies of phylogenesis. Therefore, we have thought it more opportune to wait until future studies using molecular markers definitely clear up the taxonomy of the genus *Orchis* and those related to it, rather than run the risk of adopting nomenclature which could soon become obsolete. There is no longer any doubt, however, that the *Orchis* species with a chromosome number of 2n= 36, 32 should be separated from those with a chromosome number of 2n=42, 84.

The characteristics of the genus *Orchis* (in the traditional sense) are the presence of a spur (except in *O. anthropophora*), distinct viscidia, a single bursicle and entire root-tubers.

The range of this genus includes nearly all of Europe, North Africa, the Near East and Central Asia, with the highest number of species in Southern Europe.

The chromosome number is 2n=36, 42 (32 in *O. papilionacea*, 84 in *O. patens*).

The flower of most *Orchis* species lack nectar but attract bees and bumblebees by "imitating" flowers which possess it. There is no information available on pollinators of *O. anthropophora*, the only species lacking a spur, nor on those of *O. quadripunctata* or *O. brancifortii*, two species possessing a very slender spur. I have observed in Sicily a fly of the genus *Bombylius* (or related genus), with a very long proboscis, visit the flowers of *O. brancifortii* after visiting those of *Fedia cornucopiae* (Valerianaceae). One cannot fail to notice the resemblance between the flowers of these two plants. It can be assumed that *O. brancifortii* also is pollinated as a result of "floral mimicry", as are nearly all the other species of the genus. In Italy the only *Orchis* species possessing nectar is *O. coriophora* which is pollinated by various Hymenopterans and by a few Syrphid flies.

Key of the genus Orchis

1 Lip entire **2**

1* Lip more or less deeply trilobed **3**

2 Spur narrow, about as long as the ovary ..... ***O. papilionacea***

2* Spur broad and saccate, clearly shorter than ovary ..... ***O. collina***

3 Flowers yellow **4**

3* Flowers not yellow **6**

4 Leaves spotted ..... ***O. provincialis***

4* Leaves unspotted **5**

5 Lip bearing dark dots in the centre; leaves narrow ..... ***O. pauciflora***

5* Lip unspotted; leaves broad ..... ***O. pallens***

6 All sepals directed forwards and forming a hood **7**

6* Lateral sepals spreading or erect **16**

7 Lip mid-lobe entire, longer and narrower than the side lobes ..... ***O. coriophora***

7* Lip mid-lobe not as above **8**

8 Spur horizontal or turned upwards, equalling or exceeding the ovary in length **9**

8* Spur pointing downwards, equalling or shorter than the ovary **10**

9 Lip mid-lobe shorter than or equalling the side lobes, bearing in the centre few dots roughly arranged in two rows ..... ***O. longicornu***

9* Lip mid-lobe usually longer than the side lobes, bearing in the centre numerous dots ..... ***O. morio***

10 Sepals dark **11**

10* Sepals pale **12**

11 Plant and flowers relatively small; lip less than 9 mm long ..... ***O. ustulata***

11* Plant and flowers relatively large; lip more than 9 mm long ..... ***O. purpurea***

12 Lip bearing tufts of short purplish hairs **13**

12* Lip lacking hairs, bearing purplish dots **14**

13 Lip mid-lobe divided into two linear segments, which are similar to the side lobes ..... ***O. simia***

13* Lip mid-lobe divided into two segments which are wider and shorter than the side lobes .... ***O. militaris***

14 Sepals shaded green externally ..... ***O. lactea***

14* Sepals lacking any green shade externally **15**

15 Lip mid-lobe deeply divided into two narrow and acute segments; inflorescence ovoid to subcylindrical ..... ***O. italica***

15* Lip mid-lobe slightly bilobed at the apex; inflorescence short, usually hemispherical or almost spherical ..... ***O. tridentata***

16 Spur very slender, almost filiform, about as long as the ovary **17**

16* Spur not filiform, more or less wide and more or less elongate **18**

17 Lip side lobes clearly narrower than the mid-lobe ..... ***O. brancifortii***

17* Lip side lobes wider than or of the same width as the mid-lobe ..... ***O. quadripunctata***

18 Lip mid-lobe clearly shorter than side lobes ..... ***O. laxiflora***

18* Lip mid-lobe longer than side lobes **19**

19 Sepals greenish, at least on the inner side **20**

19* Sepals pinkish or purplish **21**

20 Spur straight, clearly shorter than ovary ..... ***O. patens***

20* Spur arched, pointing downwards, about as long as the ovary ..... ***O. spitzelii***

21 Leaves linear-lanceolate, spaced along the stem ..... ***O. palustris***

21* Leaves oblong-lanceolate, massed at the base of the stem ..... ***O. mascula***

x 2

Orchis anthropophora (Linnaeus) Allioni

Systematics

This orchid is commonly known by the name *Aceras anthropophorum* (Linnaeus) W.T. Aiton; recent scientific research based on genetic markers has shown very clearly that this species belongs to the *Orchis* genus (Rossi et al., 1994; Pridgeon et al., 1997).

Description

Slender plant from 15 to 50 cm in height. Lower leaves oblong to broadly lanceolate, up to 15 cm long, forming a rosette; upper leaves smaller, erect, sheathing the stem. Inflorescence cylindrical, elongate, variably dense, many flowered. Bracts small, acute, green or yellowish-green. Sepals oval, green or yellowish, streaked and margined with dull red, forming a hemispherical hood; petals greenish, linear lanceolate, entirely hidden by the sepals. Lip without spur, hanging, deeply trilobed, with side lobes linear, much shorter than the bifid mid-lobe; the colour of the lip varies from yellow to ochre, usually darker in freshly opened flowers, sometimes bordered with reddish-brown.

Flowering period

April to June.

Geographical distribution

Mediterranean-Atlantic, from southern England to Cyprus and Lebanon eastward; it is also found in North Africa (Morocco, Algeria, Tunisia).

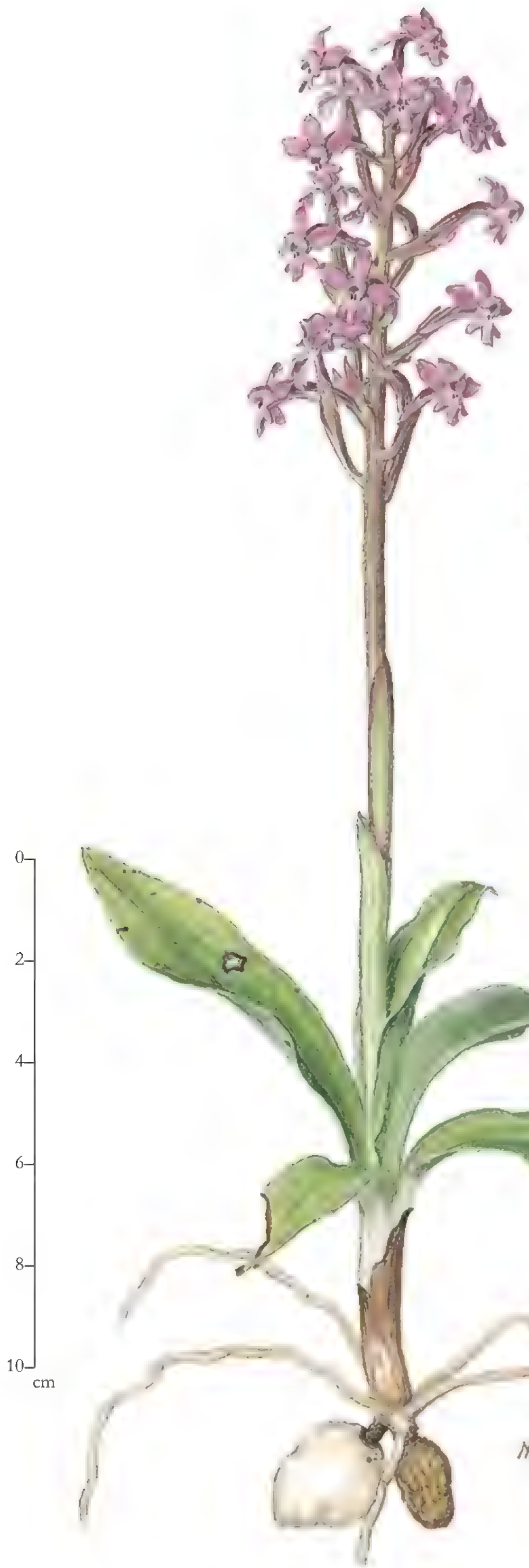
Habitat

Grassland and garrigue, up to 1500 m, on dry, calcareous soil, less commonly on neutral soil.

Status and conservation

In Italy it is widespread throughout the country, except for the Val d'Aosta, Friuli and Trentino Alto Adige regions.

Tuscany (GR), near Alberese.



x 3

Orchis brancifortii Bivona-Bernardi

Systematics

Synonyms: *Orchis quadripunctata* Cyrillo ex Tenore subsp. *brancifortii* (Bivona-Bernardi) E.G. Camus.

Description

Similar to *O. quadripunctata* but smaller (10-25 cm tall) and slenderer, with unspotted leaves, and paler flowers, whose lips have side lobes much smaller than the mid-lobe.

Flowering period

April and May.

Geographical distribution

Endemic to Sardinia and Sicily.

Habitat

Poor grassland, garrigue, and scrub, up to 1200 m, on calcareous, dry soil.

Status and conservation

In Sardinia it is found only on the calcareous mountains in the east and in Sicily on the northern mountain chains.

Sicily (TR), Riserva dello Zingaro, M. Passo del Lupo, m 650.

Orchis collina Banks et Solander ex Russel

Systematics

Synonyms: *Orchis saccata* Tenore.

Description

Plant height varying from 10 to 30 cm, but seldom exceeding 20 cm. Stem flushed violet or brown in the upper portion. Leaves relatively few, elliptical, the lower ones spreading, the upper sheathing the stem and sometimes tinged with reddish-brown. Inflorescence lax, cylindrical, usually few flowered. Bracts broadly lanceolate, about as long as the ovary or slightly longer, coloured as the stem. Sepals ovate-oblong, coloured olive-green tinged with violet or with brown, the laterals erect, more rarely spreading, the dorsal directed forwards and forming a loose hood with the smaller petals. Lip rounded, about as long as the sepals, undivided, more or less folded lengthwise, with a somewhat wavy and irregular margin, pinkish to violet more or less tinged with olive-green, occasionally pale green; spur short, saccate, whitish to pale pink, downwards pointing.

Flowering period

From mid February to mid April.

Geographical distribution

Mediterranean, from Portugal eastwards to Iran .

Habitat

Poor grassland, garrigue, open woodland and scrub, up to 900 m, on dry, calcareous to slightly acidic soil.

Status and conservation

Found in southern Italy and on the islands. A single specimen has been recently found in southern Latium (Elisabetta Aloisi Masella, personal communication).

Sardinia (SS), near Sassari, località Setti Funtani.

x 2
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cm

Orchis coriophora Linnaeus

Taxonomy

Synonyms: *Orchis fragrans* Pollini; *O. coriophora* Linnaeus subsp. *fragrans* (Pollini) Sudre; *Anteriorchis coriophora* (Linnaeus) E. Klein et Strack.

Description

Plant 15-40 cm tall. Leaves narrow, linear- lanceolate, channelled, not forming a rosette, the upper ones gradually smaller and sheathing the stem. Inflorescence ovoid to cylindrical, quite dense, composed of relatively small, sweetly scented flowers. Bracts lanceolate, acute, about as long as the ovary or slightly more, pale green, more or less shaded with purplish-pink. Sepals narrowly ovate, acute, converging to form an elongate, pointed hood. Petals as long as, but narrower than sepals, concealed by the hood. Lip about as long as the sepals, more or less strongly bent backwards, trilobed, with side lobes toothed, shorter and broader than the mid-lobe; spur conical, arched, pointing downwards, about as long as the ovary or slightly shorter. Flower colour is very variable, from almost entirely green to almost entirely violet, more frequently with various amounts and various shades of both colours; usually the basal portion of the lip is whitish, with purplish dots of variable size, which are sometimes joined to form a single, large blot; spur whitish or pinkish.

Flowering period

From mid April to the end of June.

Geographical distribution

Central and southern Europe, North Africa, and Near East.

Habitat

Poor grassland, garrigue, scrub, and pine-wood, from 0 to 1000 m, on dry to fairly damp (at least termporarily), calcareous or slightly acidic, or even sandy soil.

Status and conservation

Found in all the Italian regions, but more common in southern Italy.

Tuscany (LU), Viareggio, Macchia Lucchese.

x 2

0
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4
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10
cm

Orchis italica Poiret

Description

Sturdy plant, 20-50 cm tall. Basal leaves forming a rosette, oblong-lanceolate, with wavy margins. Inflorescence dense, at first conical, than ovoid, less frequently elongate and subcylindrical. Bracts small, less than half as long as the ovaries, lanceolate, acuminate. Sepals lanceolate, acute, forming a pinkish, elongate hood veined with purple. Petals narrowly lanceolate, shorter and darker than sepals. Lip much longer than the sepals, deeply trilobed, with side lobes linear or sickle-shaped, acute, and mid-lobe about twice as long as the side lobes, split into three linear segments, the median of which is shorter and much narrower than the lateral ones; the colour of the lip varies from almost white to purplish-red, but more frequently is pinkish with a whitish basal portion, dotted with pinkish-red; spur whitish or pinkish, about half as long as the ovary, cylindrical to more or less flattened, slightly curved, pointing downwards, with blunt or bilobed apex.

Flowering period

From March to May.

Geographical distribution

Mediterranean.

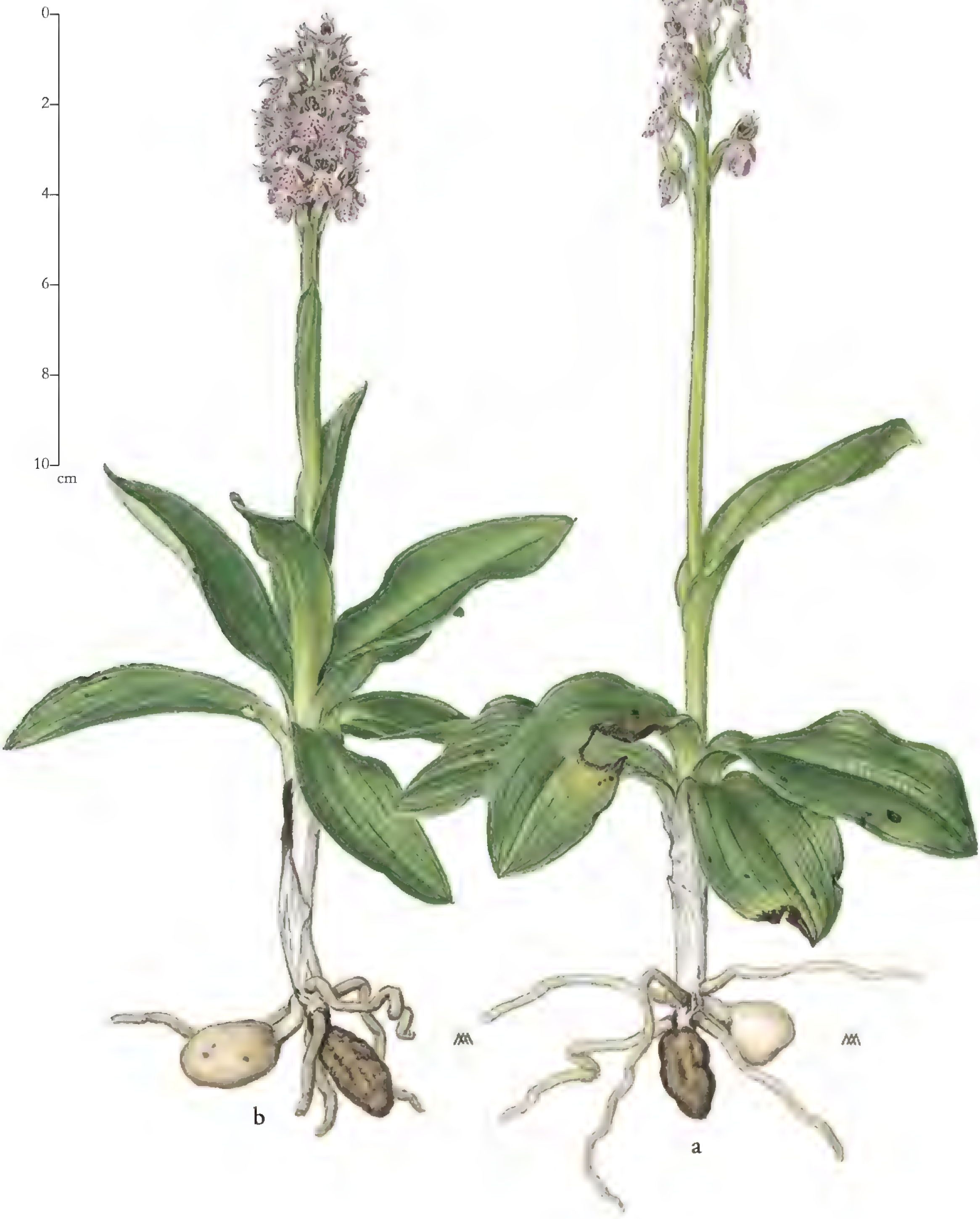
Habitat

Grassland, garrigue, scrub, open woodland up to 1300 m, on dry, calcareous soil.

Status and conservation

Widespread throughout central and southern Italy, and in Sicily; absent from Sardinia and from northern Italy (with the exception of a few old and unconfirmed records from Lombardy).

Tuscany (GR),near Capalbio.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cm
b
a

Orchis lactea Poiret

Habitat

Grassland, garrigue, scrub, up to 1000 m, on dry to relatively damp, calcareous soil.

Status and conservation

Found in Tuscany, Abruzzo, southern Italy, Sicily, and Sardinia.

Systematics

Synonyms: *Orchis tridentata* Scopoli subsp. *lactea* (Poiret) K. Richter.

Description

Plant similar to *Orchis tridentata*, from which it differs in its smaller size (5-25 cm), the shape of the inflorescence, a few flower features, and its earlier flowering period.

The inflorescence is more elongate than in *O. tridentata*, ovoid to cylindrical, usually dense. The sepals always display on the outer side a greenish shade and dark olive-green veins. The lip is usually convex, with the side lobes not curving forwards.

Flowering period

From the beginning of March to mid May.

Geographical distribution

Mediterranean, not well defined because of confusion with the closely related *Orchis conica* Willdenow.

---

a. Tuscany (GR), near Alberese; b. Sardinia (SS), Sassari, Serra Secca, m 350.

x 2

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b

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Orchis laxiflora Lamarck

straight or faintly arched, from almost horizontal to clearly upturned. Flower colour varies from pink to violet, with a whitish central area on the lip, which is seldom weakly spotted with purple at the base.

Flowering period

From mid April to mid June.

Geographical distribution

Mediterranean-Atlantic, from the Channel Islands to Turkey.

Habitat

Swamps, boggy meadows, stream sides, up to 1000 m.

Status and conservation

Recorded from all the Italian regions. However, there are no recent records for the Val d'Aosta and Trentino Alto Adige.

Systematics

The record of *O. pseudolaxiflora* Czerniakovska in Romagna (Liverani, 1991) is wrong: the plants in question are hybrids between *O. palustris* and *O. laxiflora* (Arduino et al., 1996).

Description

Plant 25-60 cm tall, rarely more. Stem flushed violet in the upper portion. Basal leaves not forming a rosette, sub-erect, narrowly lanceolate, keeled, acute. Inflorescence very lax, elongate, composed of relatively large flowers. Bracts greenish variably tinged with purple to wholly purplish, lanceolate, acute, about as long as, or slightly longer than ovary. Sepals ovate, obtuse, the laterals erect, the median pointing forwards and sometimes forming a loose hood with the petals, which are slightly smaller. Lip trilobed, slightly longer than the sepals; side lobes rounded, more or less reflexed, with irregular margins, distinctly longer than the truncate mid-lobe; spur shorter than the ovary, cylindrical, slightly thickened at the apex,

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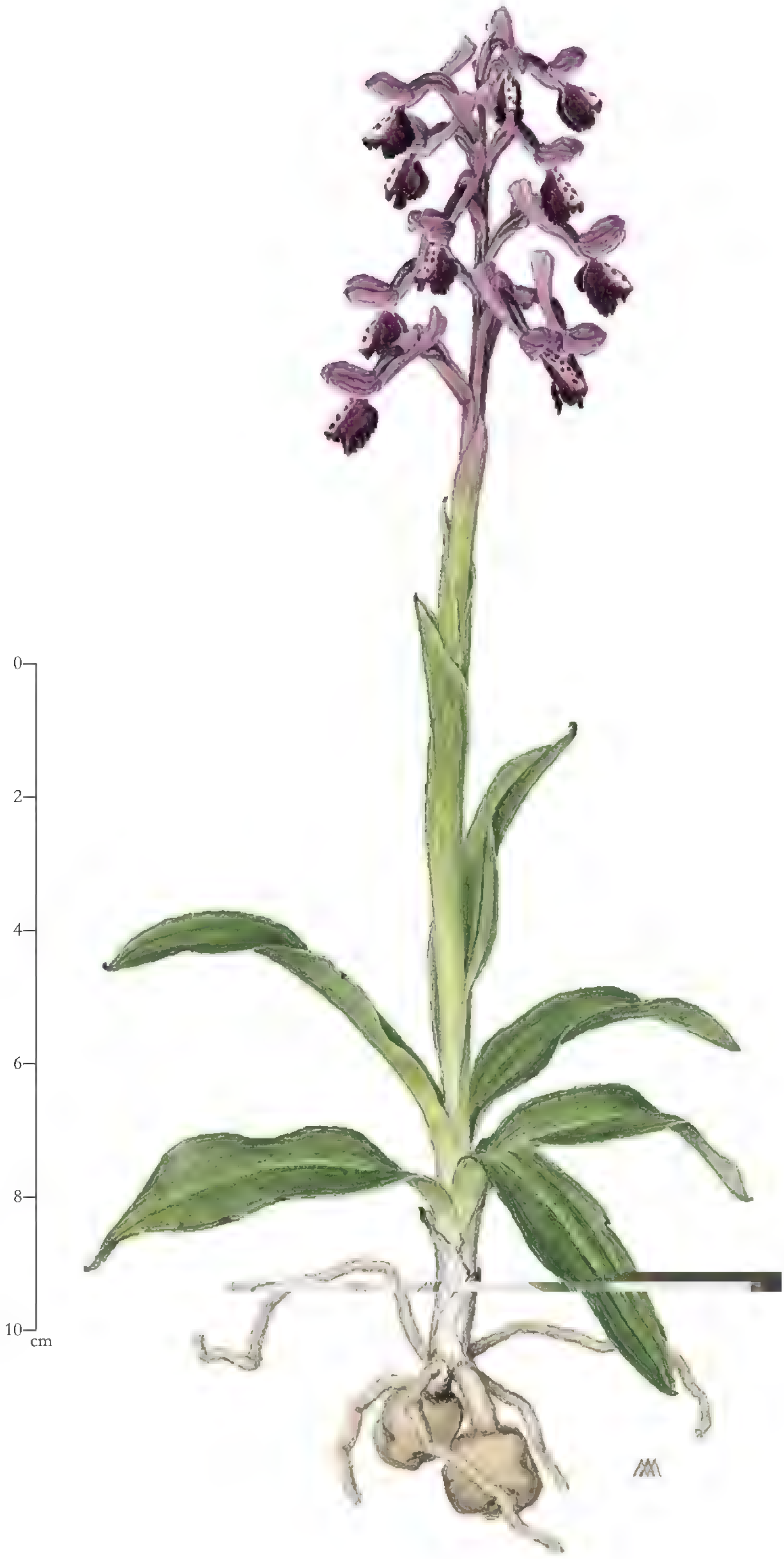
a & b. Tuscany (FI), near Pratolino, m 450; c. Apulia (LE), Salento, Palude di Rauccio.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cm

Orchis longicornu Poiret

Systematics

O. longicornu and *Orchis morio* are not only very similar, but also display a low genetic differentiation (Corrias et al., 1991), and form hybrid swarms where they coexist, as in Sicily, or come in contact, as in southern Corsica (Arduino et al., 1991); therefore these orchids should not be considered as two distinct species.

Description

Very similar to *Orchis morio*, from which it differs in the following characters: inflorescence more lax; pale central area of the lip sharply contrasting with the much darker lateral lobes; spots on the lip fewer and generally aligned in two rows only; mid-lobe of the lip entire and often shorter than the lateral ones; spur longer on average.

Flowering period

From the end of February to the beginning of June, about ten days before *Orchis morio* where the two orchids are found together.

Geographical distribution

Northern Africa (Algeria and Tunisia), Balearic Islands, southern Corsica, Sardinia and Sicily.

Habitat

Grassland, garrigue, scrub, open woodland, up to 1200 m, on any kind of soil.

Status and conservation

Very common in Sardinia; it is also common in Sicily, where it is frequently crossed with *Orchis morio*. On the Tyrrhenian coast desultory specimens are found (probably produced from seeds carried by the wind) which bloom for one or two years at the most and then disappear

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Sardinia (SS), near Osilo, hills around Lago di Búnari, m 350.

x 1,3

x 1,3

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cm

Orchis mascula (Linnaeus) Linnaeus

Systematics

Synonyms: *O. signifera* Vest; *O. mascula* subsp. *signifera* (Vest) Soó; *O. ovalis* F.W. Schmidt ex Mayer.

Description

Plant 20-50(60) cm tall. Stem frequently flushed purple above. Basal leaves lanceolate to oblong, shiny green, often dotted with deep purple at the base; upper leaves narrower and more pointed, sheathing the stem. Inflorescence cylindrical, more or less dense, composed of relatively large flowers coloured purplish-red to mauve. Bracts violaceous, lanceolate, acute, about as long as the ovary. Sepals narrowly ovate, with obtuse to acute apex, the laterals erect or spreading, the dorsal pointing forwards. Petals shorter than sepals, forming a loose hood. Lip distinctly longer than other perianth segments, with a much paler central area spotted with purple, trilobed, with the side lobes more or less reflexed and the longer mid-lobe notched or denticulate at the apex; spur about as long as the ovary, cylindrical, slightly thickened at the apex, from almost horizontal to clearly upturned.

Flowering period

From mid April to the end of June.

Geographical distribution

In Europe it is found from the Arctic Circle to Sicily, and from the British Isles to the Caucasus; also present in northern Africa (Morocco, Algeria, and Tunisia), in the Canary and Azores Islands, and introduced into North America.

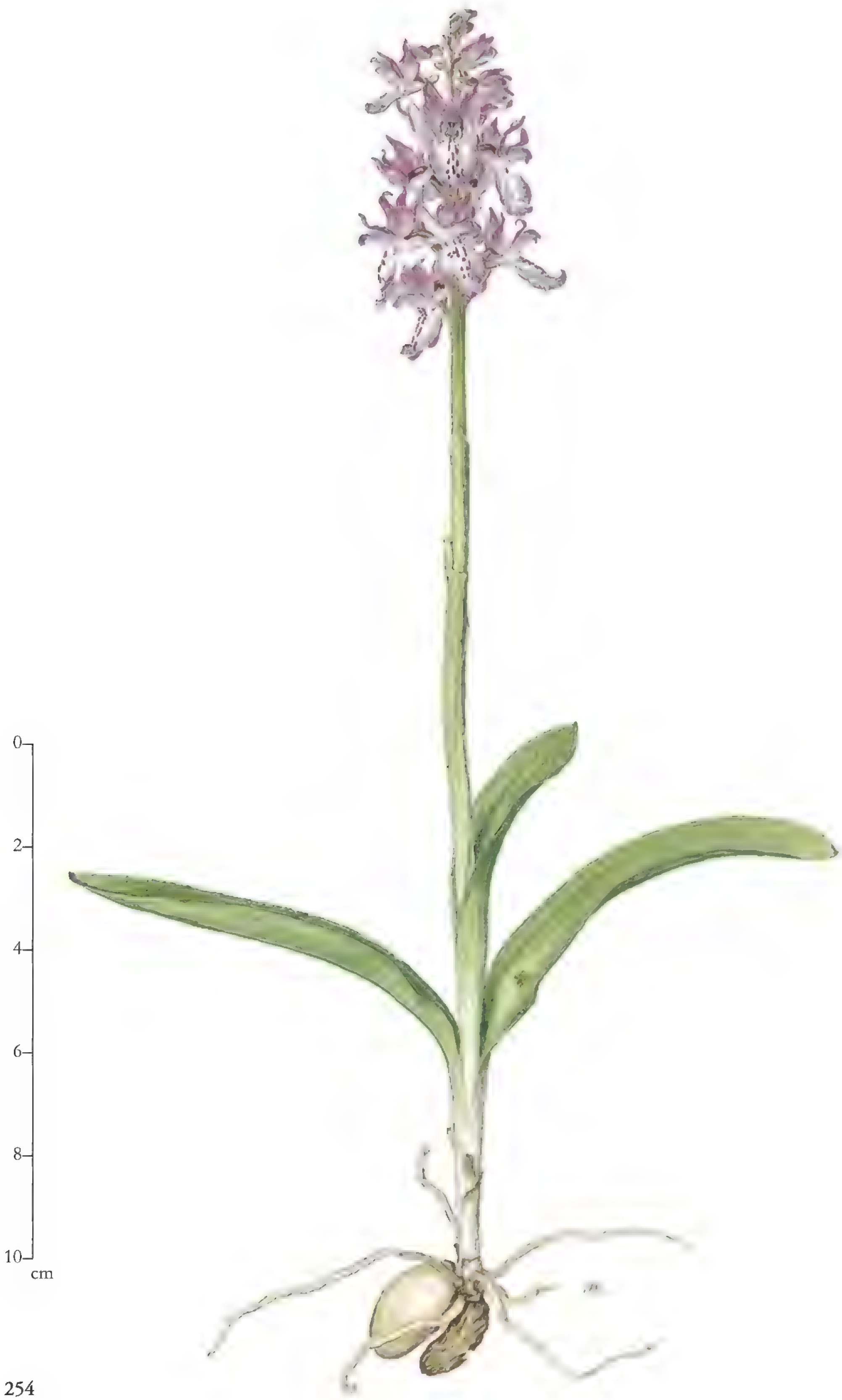
Habitat

Poor grassland, open woodland, mountain meadows, up to 2570 m, on alkaline to neutral, dry to relatively damp soil.

Status and conservation

Present in most of the Italian regions, with the exception of Apulia and Sicily; in Sardinia it is replaced by subspecies *ichnusae*.

Tuscany (FI), near Vallombrosa, m 1250.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cm

Orchis mascula (Linnaeus) Linnaeus
subsp. **ichnusae** Corrias

Systematics

Synonyms: *Orchis ichnusae* (Corrias) J. et P. Devillers-Terschuren; *O. olbiensis* subsp. *ichnusae* (Corrias) Buttler.

Description

It differs from the subsp. *mascula* in its smaller size (15-30 cm), shorter inflorescence, smaller and paler flowers, and shorter spur.

Flowering period

April and May.

Geographical distribution

Endemic to Sardinia and Corsica; its presence in the Balearic islands needs confirmation.

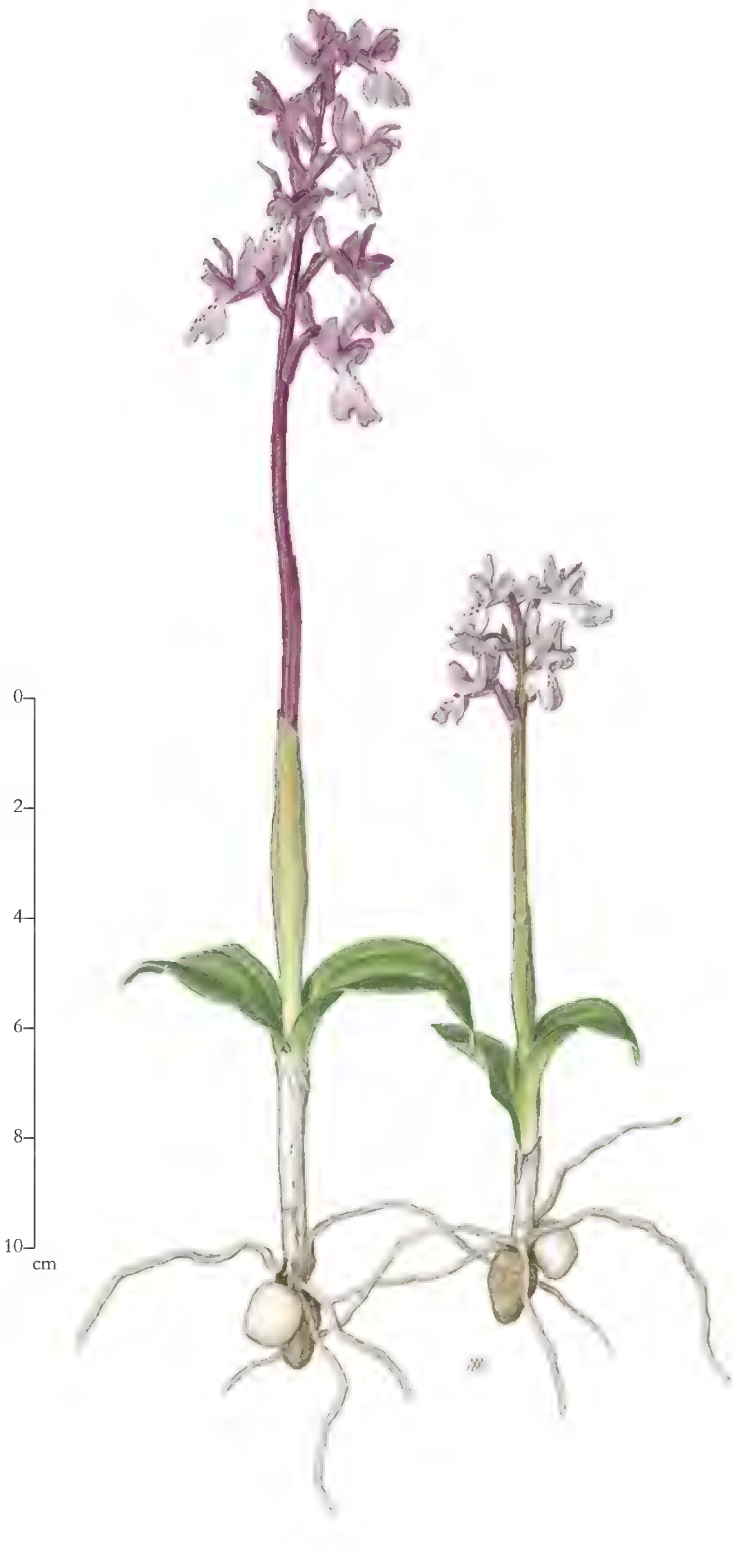
Habitat

Poor grassland, garrigue, open woodland, from 200 to 1400 m, on alkaline, dry soil.

Status and conservation

Only found on the calcareous mountains of central-eastern and south-western Sardinia, were it can be locally common.

Sardinia (CA), near Domusnovas.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cm

Orchis mascula (Linnaeus) Linnaeus
subsp. **olbiensis** (Reuter ex Barla) Ascherson et Gräbner

Systematics
Synonyms: *Orchis olbiensis* Reuter ex Barla.

Description
Similar to subsp. *mascula* from which it differs in its smaller size (10-30 cm tall), slenderer habit, broader leaves, shorter inflorescence, smaller and paler flowers, and more elongated spur.

Flowering period
From the end of March to the beginning of May.

Geographical distribution
W-Mediterranean: Liguria (Italy), southern France, Iberian Peninsula, North Africa, and Corsica.

Habitat
Poor grassland, garrigue, open woodland, up to 600 m, on alkaline, dry soil.

Status and conservation
In Italy it is only found in a few locations in western Liguria.

Liguria (IM), between Villatella and S. Antonio, near Mortola.

x 2

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Orchis militaris Linnaeus

Flowering period

May and June.

Geographical distribution

Eurasian, from southern England to Siberia.

Habitat

Grassland, scrub, open wood, up to 1800 m, on dry to damp, calcareous soil.

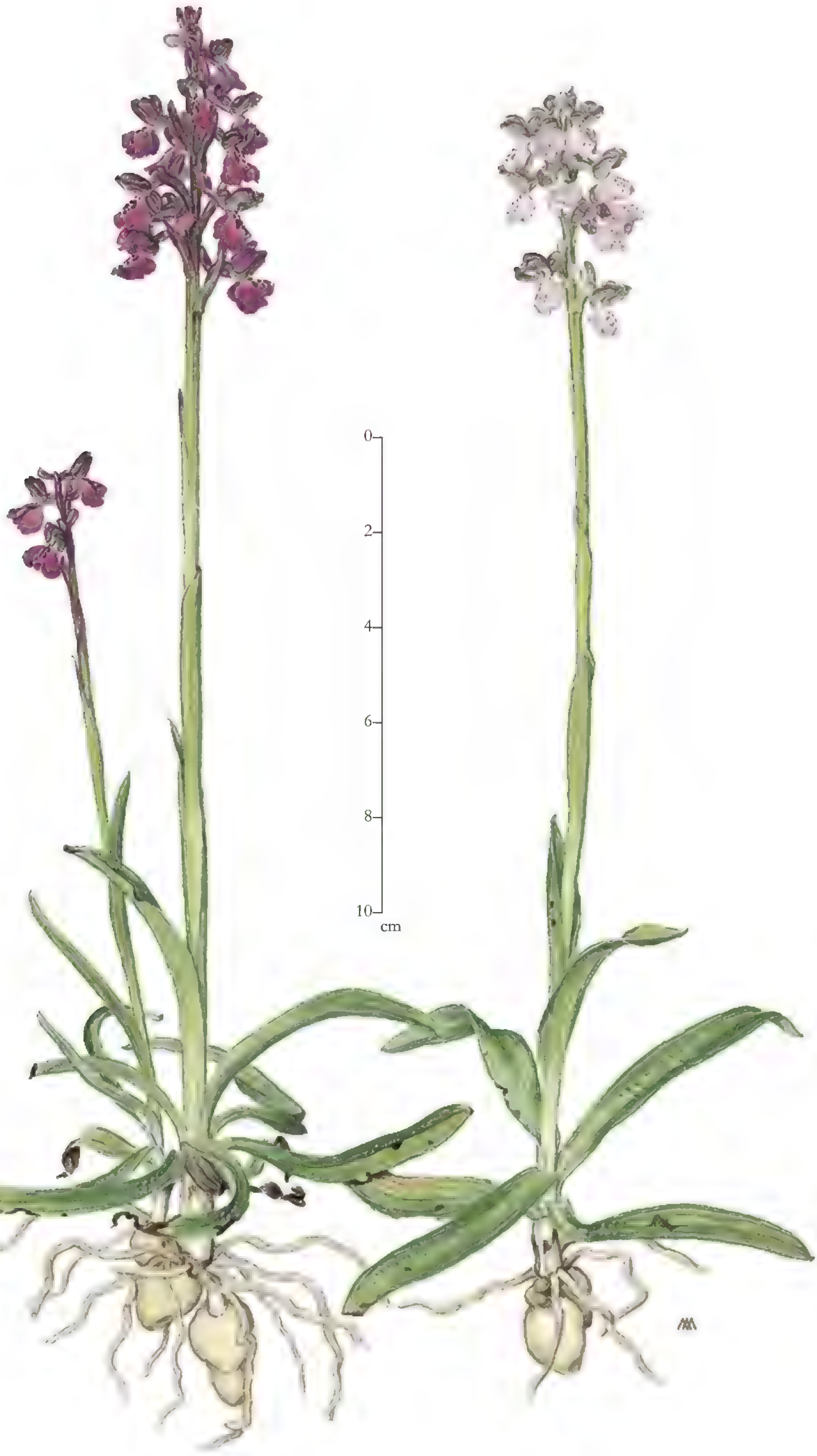
Status and conservation

Found in all the regions of northern and central Italy, absent from the south and from the islands.

Description

Plant 20-50 cm tall, rarely more. Leaves shiny, broadly lanceolate, sub-erect, the upper ones sheathing the stem, which is often tinged with violet in the upper portion. Inflorescence variably dense, at first ovoid, than elongate and broadly cylindrical. Bracts violaceous, very small. Sepals whitish or greyish-pink outside, veined with violet inside, lanceolate, forming an elongate hood, the acute apices slightly diverging. Petals linear, slightly shorter and much narrower than sepals, concealed by the hood. Lip slightly longer than the sepals, deeply trilobed, with side lobes linear, rounded and slightly enlarged at the tip, much shorter than the mid-lobe, which is strap-like for more than half of its length, and then split into two relatively short and broad segments separated by a small tooth; the central portion of the lip is whitish, dotted with tufts of purplish hairs, while the distal portions are lilac to violet-purple; spur whitish or pinkish, about half as long as the ovary, cylindrical, slightly curved, pointing downwards, with blunt or bilobed apex.

Veneto (VI), Schio, M. Summano, m 1100.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Orchis morio Linnaeus

Systematics

The presence in Italy of *Orchis morio* subsp. *picta* (Loiseleur) K. Richter (= *O. picta* Loiseleur) has been frequently reported; recent studies based on molecular markers (Rossi et al., 1992) have shown that the Italian populations are genetically homogeneous and cannot be separated into two different subspecies.

Description

Plant 10-40 cm tall. Stem flushed violet in the upper portion. Leaves from broadly to narrowly lanceolate, the lower ones sometimes forming a basal rosette, otherwise sub-erect, the upper forming sheaths around the stem and often tinged with purple. Inflorescence variably dense and more or less elongate, composed of a very variable number of flowers. Bracts lanceolate, about as long as the ovary or slightly longer, pale green tinged with pink to almost entirely violet. Sepals ovate-oblong, obtuse, converging to form a hood, which can be tight or loose. Petals slightly shorter and much narrower than sepals. Lip about as long as sepals and distinctly wider than long, from almost flat to almost folded in two, its margins irregular and sometimes wavy, more or less deeply trilobed, with side lobes rounded, about as long as the mid-lobe, which is truncate or indented; spur cylindrical or club-shaped, about as long as the ovary, straight or slightly arched, horizontal or upturned. Flower colour varies from very pale pink to deep violet; sepals and petals are clearly veined with green, while the central portion of the lip is whitish with purplish spots variable in size.

Flowering period

From March to June.

Geographical distribution

Europe, northern Africa and the Near East.

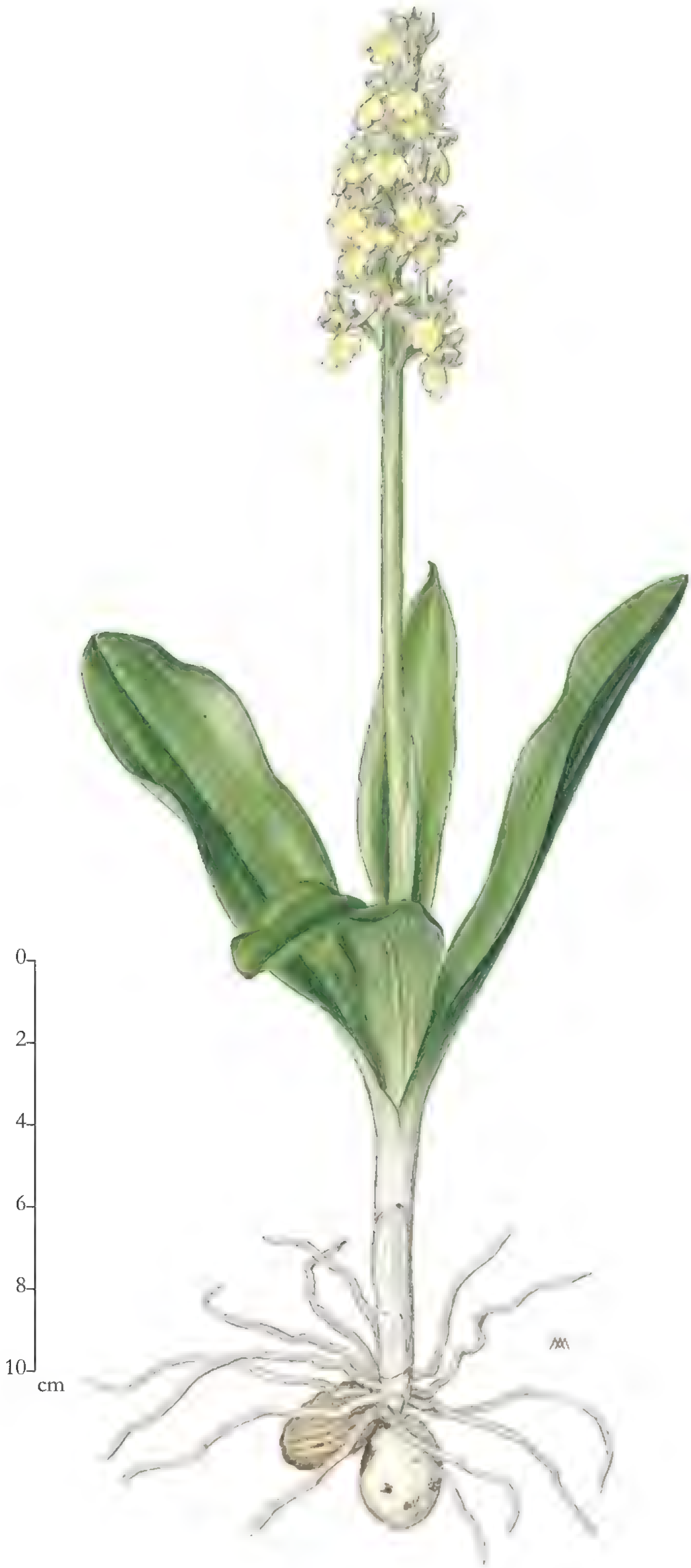
Habitat

Grassland, garrigue, open woodland, up to 1500 m, on calcareous or slightly acidic, dry or variably damp soil.

Status and conservation

Recorded from all the Italian regions except Sardinia, where it is replaced by *Orchis longicornu*; in Sicily most populations are crossed with *O. longicornu*.

Tuscany (GR), near Capalbio.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Orchis pallens Linnaeus

Habitat

Mountain meadows, dwarf mountain scrub, open woodland, between 300 and 2000 m, on calcareous to slightly acidic soil.

Status and conservation

Found in most of the regions of the mainland, except Umbria and Apulia; very rare in the south.

Description

Plant 15-35 cm tall. Leaves sub-erect and not forming a rosette, shiny, quite broad, oblong- obovate. Inflorescence dense, ovoid to oblong, composed of relatively large flowers coloured pale yellow. Bracts whitish to greenish, lanceolate, acute, about as long as the ovary, or slightly more. Sepals ovate, obtuse, concave, the laterals erect, the dorsal forming a hood with the petals, which are slightly smaller. Lip longer than the sepals and broader than long, slightly convex, faintly trilobed, with mid- lobe larger than the laterals, entire to slightly bilobed; spur cylindrical, about as long as the ovary, slightly arched, horizontal or pointing upwards.

Flowering period

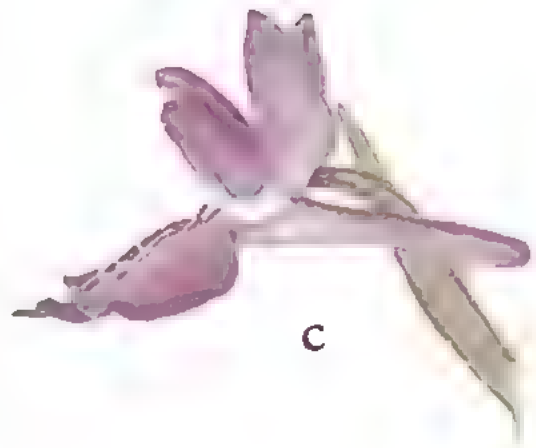
From the end of April to the end of June.

Geographical distribution

European-Caucasian, from the Pyrenees to the Caucasus.

Emilia Romagna (RE), Appennino Reggiano, Terme di S. Lucia, m 1000.

x 1,5



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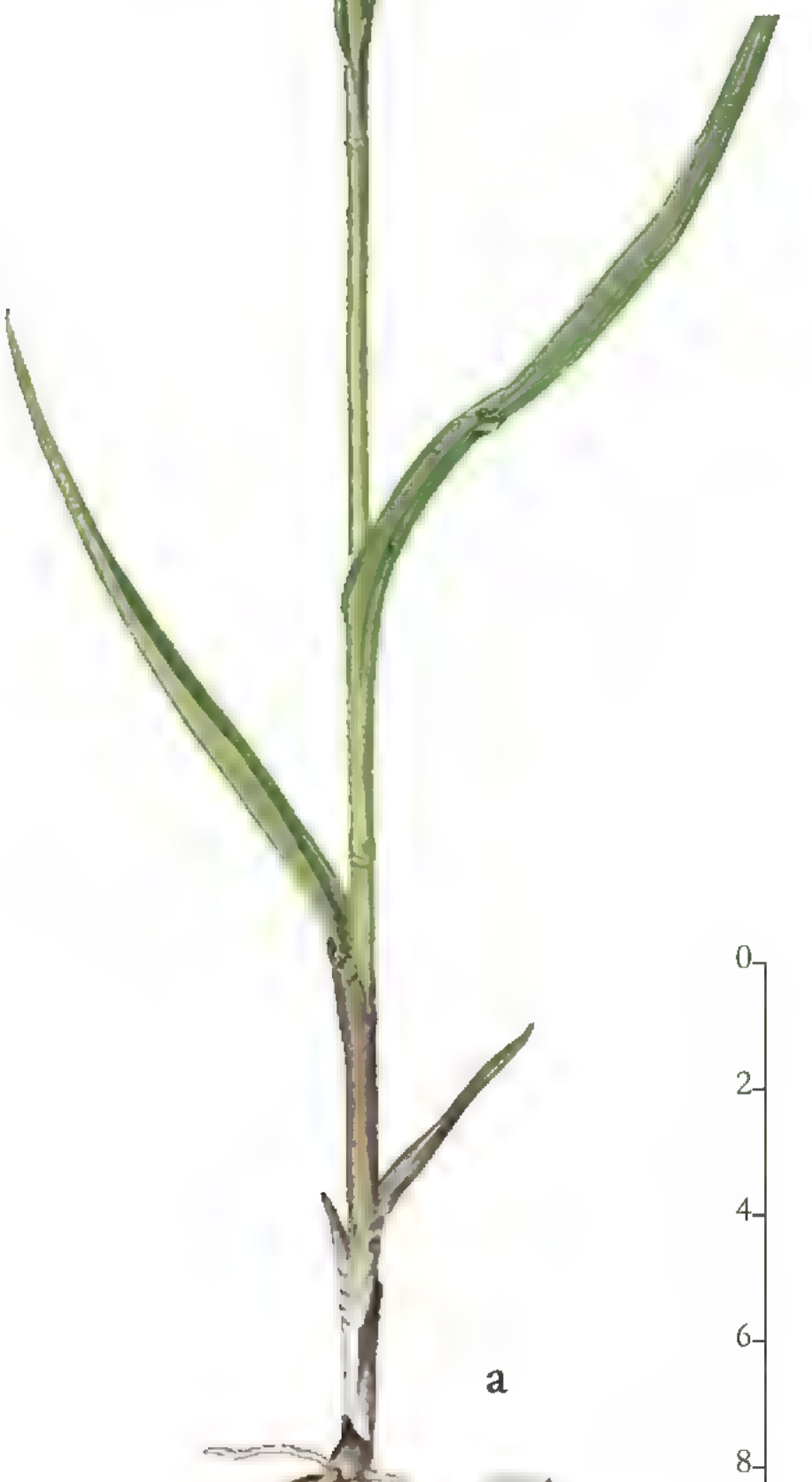

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Orchis palustris Jacquin

Habitat

Swamps and marshes, coastal lakes, tolerant of brackish water, up to 500 m.

Status and conservation

This species is quite rare in Italy, where it is present in few locations in Lombardy, Veneto, Friuli, Emilia Romagna, Tuscany, Latium, Campania and Apulia. Recorded from single locations in Abruzzo and Basilicata; not recorded recently from Sicily; absent elsewhere.

It is listed as "vulnerable" in the "red book" of Italian plants (Conti, Manzi & Pedrotti, 1992).

Systematics

Synonyms: *O. laxiflora* Lamark subsp. *palustris* (Jaquin) Bonnier et Layens.

Description

Very similar to *Orchis laxiflora*, from which it differs mainly in the shape of the inflorescence and of the lip, and in its paler colour. The inflorescence is more dense because the ovaries are shorter, and therefore the flowers are closer to the stem. The mid-lobe of the lip is longer than the side lobes and distinctly bilobed at the apex; moreover, the lip always bears purplish dots and streaks in the centre.

Flowering period

May and June, about 2 weeks later than *O. laxiflora*.

Geographical distribution

Europe, North Africa (with the var. robusta Stephenson) and Asia as far as Afghanistan eastwards, and Saudi Arabia southwards.

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a & b. Tuscany (GR), Maremma Natural Park; c. Tuscany (LU), Viareggio, Macchia Lucchese.

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cm
a
b
c

Orchis papilionacea Linnaeus

Systematics

Synonyms: *Orchis rubra* Jacquin in Murray.

Description

Plant 15-40(50) cm tall. Stem often flushed with reddish-brown in the upper portion. Leaves narrowly lanceolate and acute, the lower ones keeled, spreading or sub-erect, the upper sheathing the stem and sometimes tinged with reddish-brown. Inflorescence variably dense and elongate, composed of a very variable number of relatively large flowers. Bracts pinkish to purplish with darker veins, broadly lanceolate, longer than the ovary. Sepals broadly lanceolate, usually pointing forwards, from pale pink to reddish-violet with dark, almost parallel veins. Petals oblong, shorter and narrower than sepals, directed forwards or converging to form a very loose hood. Lip as long as the sepals, orbicular, quite variable in width, concave to flat, entire, abruptly constricted at the base, rounded at the apex, slightly undulate at the margin; the colour is pink, more or less intense, usually paler in the centre and at the base, sometimes with darker veins fanning out from the base; spur whitish or pinkish, conical, slightly shorter than the ovary, straight or more frequently arched and pointing downwards.

In variety *grandiflora* Boissier the lip is wider, flatter, paler, and more heavily veined (fig. c).

Flowering period

From the end of February to mid June.

Geographical distribution

Mediterranean; var. *bruhnsiana* Gruner (= *Orchis caspia* Trautvetter) reaches the Caspian Sea.

Habitat

Poor grassland, garrigue, open woodland and scrub, up to 1400 m, on dry, calcareous to slightly acidic soil.

Status and conservation

Found in all the regions except Friuli and, maybe, Trentino Alto Adige (Perazza, 1992). The variety *grandiflora* is only found in Sardinia and Sicily.

c. Sicily (RG), pine-wood of Vittoria; a. Tuscany (GR), Montepescali, Poggio Romano; b. Tuscany (GR), Maremma Natural Parck.

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cm

Orchis patens Desfontaines

Description

Plant 25-50(60) cm tall. Upper portion of the stem tending to violet. Basal leaves narrowly oblanceolate, keeled, sometimes bearing brownish spots; upper leaves smaller, sheathing the stem, tinged with violet at their tip. Inflorescence lax, cylindrical, composed of relatively large flowers. Bracts violaceous, very narrow and acute, about as long as the ovary. Sepals narrowly ovate, with obtuse to rounded apex, the inner side greenish dotted purple in the centre, lilac margined, darker on the outer side, the laterals spreading to erect, the dorsal directed forwards, forming a loose hood with the slightly smaller petals. Lip lilac to purplish-pink, paler and dotted purple at the base, more or less folded lengthwise, deeply trilobed, with lateral lobes sickle-shaped, and mid-lobe distinctly longer, toothed or emarginate at the tip; spur conical, almost horizontal, about half as long as the ovary.

Flowering period

From the end of April to mid June.

Geographical distribution

Disjunct: on the Atlas Mountains in northern Africa (Algeria and Tunisia), and in Liguria.

Habitat

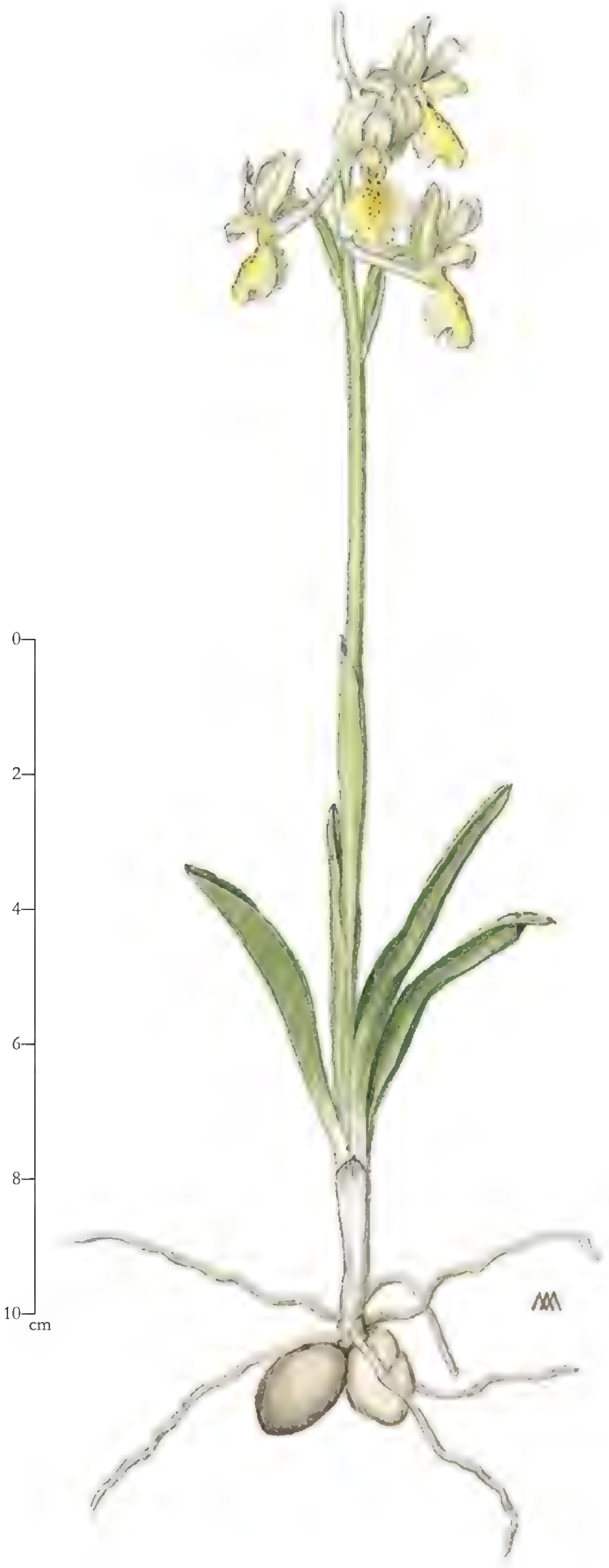
Grassland, open woodland, and olive groves, up to 600 m, on slightly acidic, dry to relatively damp soil.

Status and conservation

In Italy this orchid is only found in Liguria, and, although it is vulnerable because of its narrow range, it does not seem particularly endangered.

It is listed as "vulnerable" in the "red book" of Italian plants (Conti, Manzi & Pedrotti, 1992).

Liguria (GE), near Lavagna.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cm

Orchis pauciflora Tenore

Description

Plant 10-30 cm tall. Leaves relatively small, narrowly lanceolate, pale green. Inflorescence compact, usually composed of few flowers (3-10, rarely more) coloured yellow. Bracts yellowish, acute, about as long as the ovary. Sepals ovate, the laterals erect, the dorsal pointing forwards and forming a loose hood with the slightly shorter petals. Lip about as long as the sepals, much broader than long, convex to strongly folded lengthwise, bearing small dark dots near the base, weakly trilobed, with irregular margins; spur longer than the ovary, cylindrical, slightly arched and pointing upwards.

Flowering period

From the end of March to the beginning of June.

Geographical distribution

Central Mediterranean region, from Corsica in the NW to Crete in the SE.

Habitat

Poor grassland and garrigue, up to 1800 m, on dry, calcareous soil.

Status and conservation

Found in all the regions of central and southern Italy, but not in the islands.

Tuscany, Alpi Apuane, Passo del Vestito, m 1100.

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cm
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b

Orchis provincialis Balbis ex Lamarck et de Candolle

Description

Plant 20-40 cm tall. Leaves oblong-lanceolate, heavily spotted with brownish-violet on the upper side. Inflorescence lax, cylindrical, elongate, composed of a very variable number of relatively large flowers coloured pale yellow. Bracts yellowish-green, about as long as the ovary or slightly shorter. Sepals ovate, with wavy margins, the laterals erect, the dorsal pointing forwards. Petals slightly smaller than sepals, converging to form a loose hood. Lip about as long as the sepals, broader than long, usually folded lengthwise, bearing small purple dots in the middle, trilobed, with side lobes rounded and mid-lobe truncate; spur about as long as the ovary or slightly longer, cylindrical, slightly arched upwards, somewhat enlarged at the apex.

Flowering period

From the beginning of April to mid June.

Geographical distribution

Mediterranean, also present in Crimea and the Caucasus.

Habitat

Woodland and scrubland, less commonly in damp mountain meadows, up to 1500 m, on deep soil.

Status and conservation

Recorded from all the Italian regions, but recent records from Friuli and Val d'Aosta; it seems to have disappeared from its single location in the Trentino (G. Perazza, personal communication).

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a. Tuscany (FI), near Vallombrosa, m 1100; b. Sardinia (NU), Altopiano di Campeda, near Badde Sálighes, m 900.

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Orchis purpurea Hudson

Description

Robust plant 30-70 cm tall. Leaves shiny green, broadly-lanceolate to ovoid, quite large, up to 20 cm long. Inflorescence dense, many flowered, at first ovoid, than cylindrical. Bracts small, acute, violaceous. Sepals ovate, acute at the apex, forming a hemispherical hood coloured green, heavily spotted and veined with purplish brown on both sides. Petals narrowly lanceolate, almost entirely hidden by the sepals. Lip quite large, very variable, deeply trilobed, with lateral lobes linear to spatulate, sometimes falcate (sickle-shaped), always much shorter and narrower than the dorsal lobe, which is more or less deeply divided in two broad, diverging lobules with irregular margins, with a very small, tooth-like appendage in between; the ground colour of the lip is white to pale pink, sometimes with a variably extended purplish margin, dotted with tufts of purplish hairs; spur pinkish, almost half as long as the ovary, curved downwards, broadly cylindrical, slightly enlarged at the apex.

Flowering period

From April to June.

Geographical distribution

Eurasian, from southern England to the Caucasus; also present in northern Africa (Algeria).

Habitat

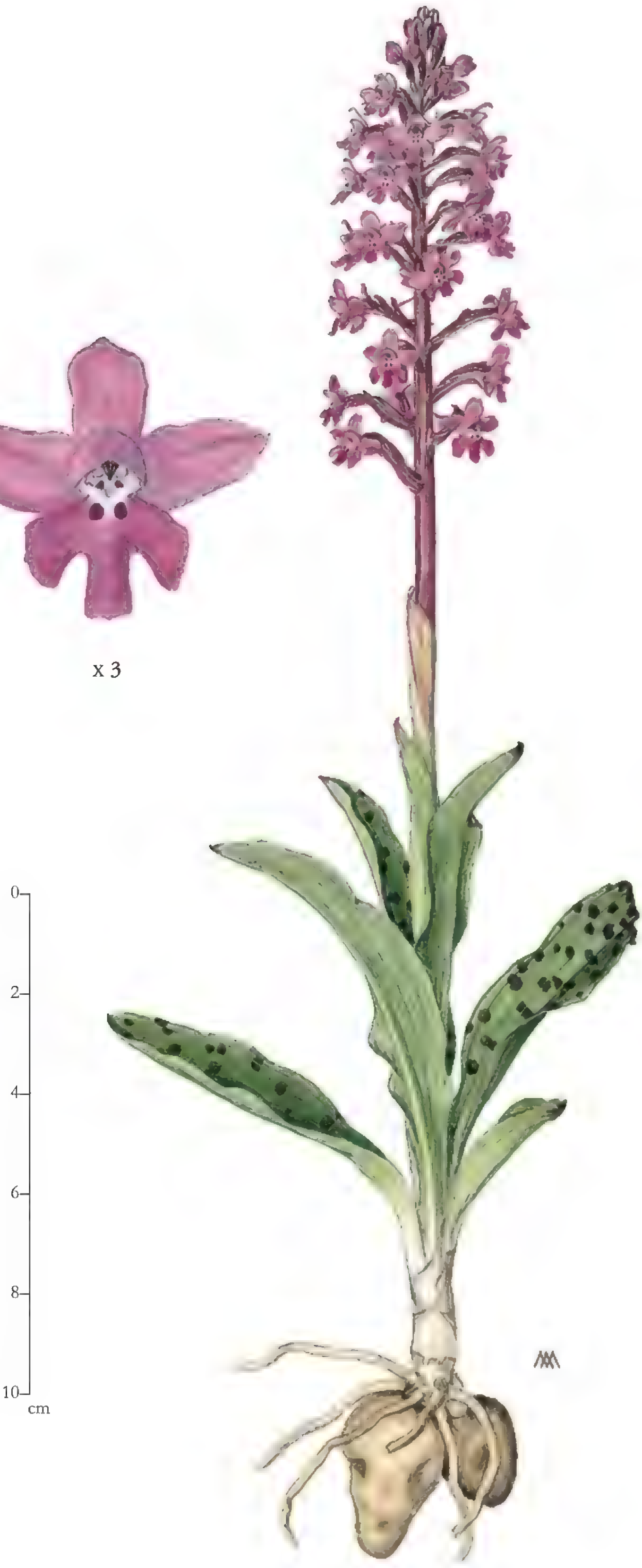
Grassland, garrigue, scrub, open wood, up to 1300 m, on alkaline to neutral, dry to relatively damp soil.

Status and conservation

It is present in all the Italian regions; uncommon in Calabria, Sardinia and Sicily.

Tuscany (FI), near Pratolino, m 450.

x 3



Orchis quadripunctata Cyrillo ex Tenore

Description

Plant 15-30(35) cm tall. Stem frequently flushed reddish violet above. Basal leaves narrowly elliptic, often spotted with deep purplish-brown; upper leaves smaller, sheathing the stem. Inflorescence variably dense, ovoid to cylindrical, composed of relatively small flowers coloured lilac to purple. Bracts violaceous, lanceolate, obtuse, shorter than the ovary. Lateral sepals spreading, ovate, with obtuse apex, the median somewhat shorter and broader. Petals much shorter than sepals, with rounded apex, forming a loose hood. Lip broader than it is long, trilobed, with the truncate mid-lobe about as broad as, or narrower than the side ones; at the base of the lip there is a whitish area with usually 2(4) dark, purplish spots; 2 more spots are found inside the spur entrance and are hardly visible; spur about as long as the ovary, filiform, truncate at the apex, slightly curved, pointing downwards.

Flowering period

April and May.

Geographical distribution

South-Eastern Europe and Asia Minor: southern Italy, former Yugoslavia, Albania, Greece (Crete included), Turkey, and Cyprus.

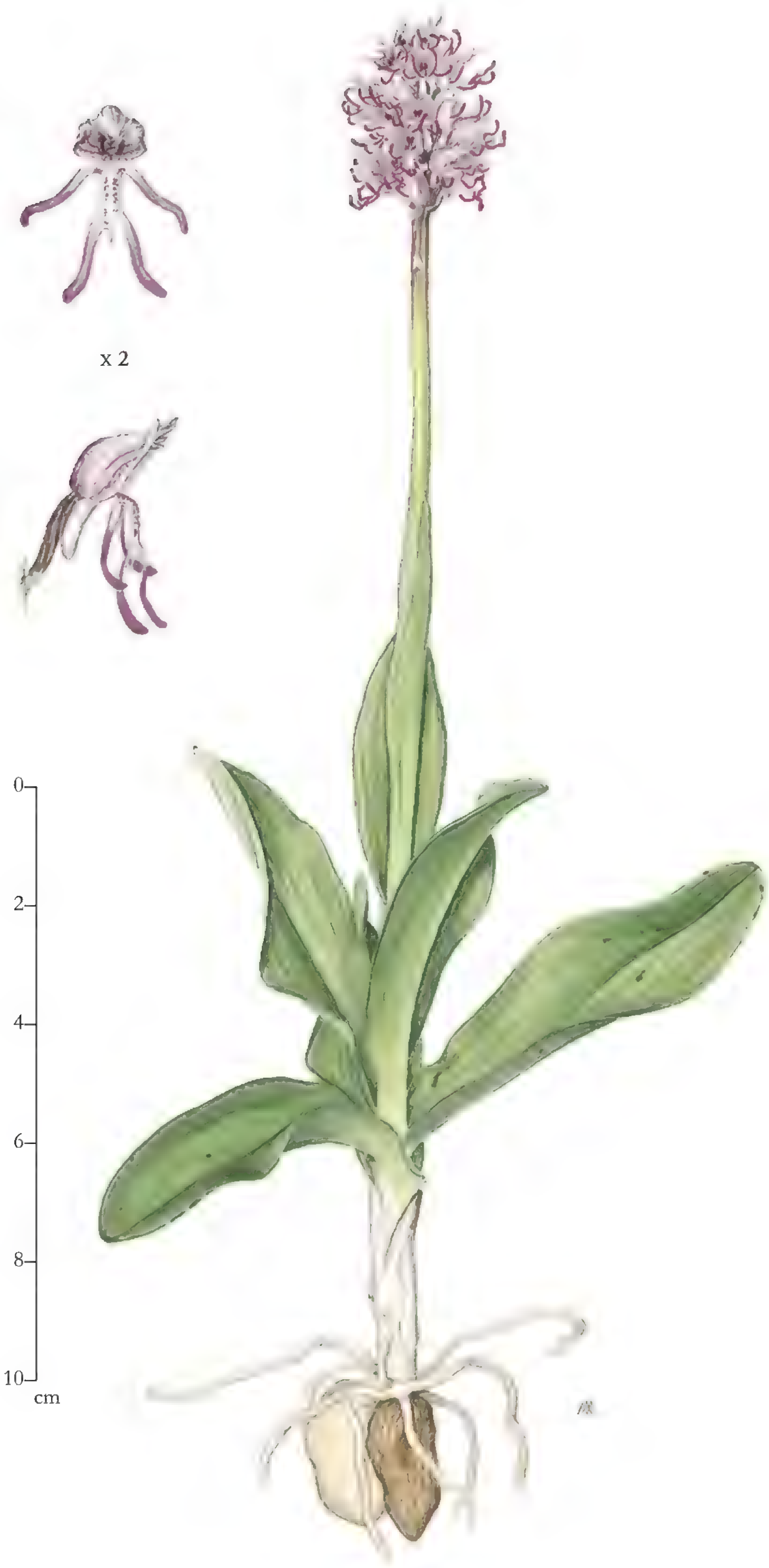
Habitat

Poor grassland and garrigue, up to 1200 m, on calcareous, dry soil.

Status and conservation

In Italy it is found in Campania, Basilicata, Apulia, and Calabria; reported also in Abruzzo, where it is very uncommon.

Basilicata (PZ), near Maratea.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Orchis simia Lamarck

Description

Plant 20-45 cm tall, rarely more. Leaves broad, oval to lanceolate, up to 20 cm long, shiny, light green. Inflorescence dense, initially ovoid, becoming broadly cylindrical, with flowers opening from the tip down. Bracts very small, up to 4 mm long, membranaceous, whitish to pinkish. Sepals narrowly ovate, forming a whitish (rarely pinkish), elongate hood spotted and veined with lilac, more heavily inside. Petals narrowly lanceolate, almost entirely hidden by the sepals. Lip much longer than the sepals, deeply trilobed, with mid-lobe linear for about half of its length, and then split into three segments, the median of which is much smaller than the lateral ones, which are quite long, linear, iregularly and asymmetrically curved, and very similar to the lateral lobes; the basal portion of the lip and the undivided portion of the median lobe are white, dotted with tufts of purplish hairs, while the distal portions are lilac to deep purple; spur whitish, about half as long as the ovary, cylindrical or claviform, slightly curved, pointing downwards.

Flowering period

From mid April to mid June.

Geographical distribution

Mediterranean-Atlantic, from southern England and Holland eastward to Iran and Turkmenistan; uncommon in North Africa (Algeria and Tunisia; records from Libya are probably incorrect).

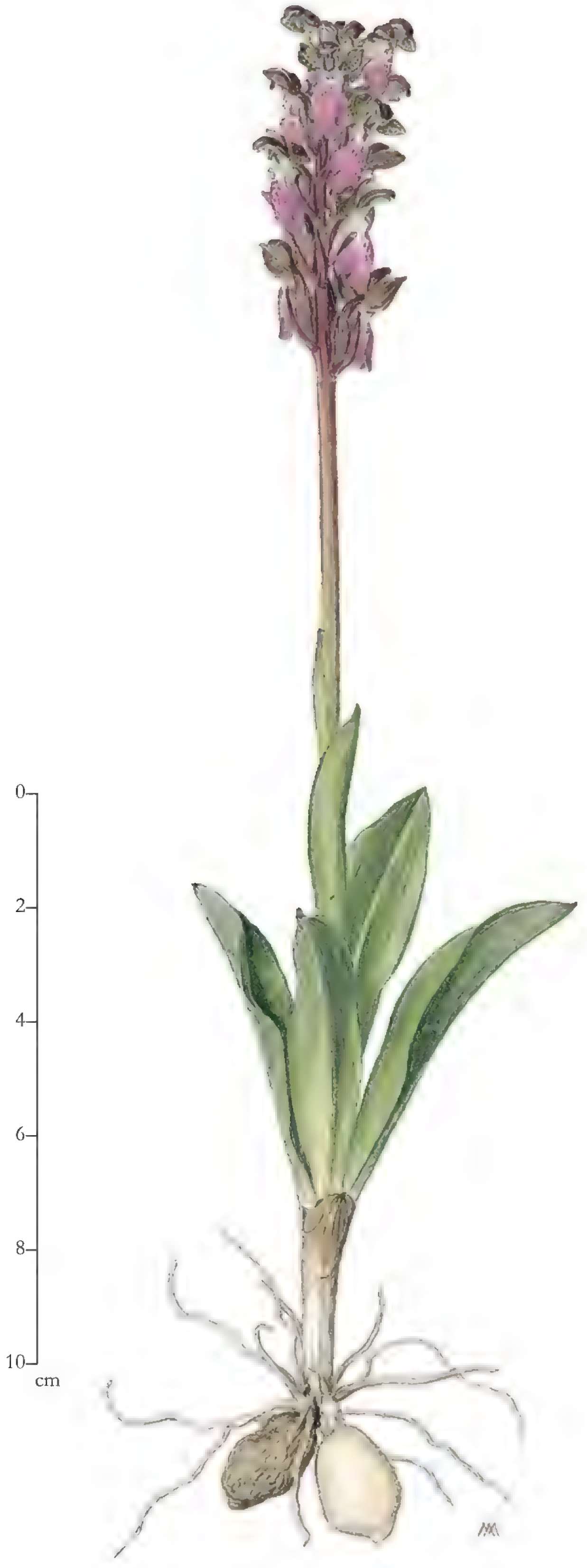
Habitat

Grassland, scrub, open wood up to 1200 m (rarely up to 1800 m), on dry, calcareous or neutral soil.

Status and conservation

In Italy it is widespread throughout the mainland, but it is less common in the south; it has been reported only once from Sicily (Künkele & Lorenz, 1995); absent from Sardinia, Apulia and Val d'Aosta.

Tuscany (GR), near Capalbio.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Orchis spitzelii Sauter ex W.D.J. Koch

Description

Plant 15-35 cm tall. Upper portion of the stem purplish brown. Basal leaves suberect, oblong- obovate, the upper ones smaller, sheathing the stem. Inflorescence cylindrical, quite dense, composed of relatively large flowers. Bracts purplish-red, lanceolate, acute, about as long as the ovary. Sepals narrowly ovate, obtuse at the apex, concave, directed forwards, dark purplish-red to greenish on the outer side, greenish dotted purple on the inner side. Petals paler and slightly shorter than sepals, oblong, rounded or truncate at the apex, forming a hood with the dorsal sepal. Lip lilac to purplish-red, more or less heavily dotted with purple, convex or folded lengthwise, quite long, trilobed, with side lobes short, rounded or truncate, and mid-lobe distinctly longer, indented at the tip; spur pinkish to purplish, narrowly conical, obtuse at the apex, slightly arched, pointing downwards, about as long as, or slightly shorter than the ovary.

Flowering period

From the end of May to mid July.

Geographical distribution

The range of this orchid is a very fragmented one. In fact, it is present with a "leopard's skin" distribution in North Africa (Algeria and Morocco), in the Middle East (Lebanon and Turkey), on the Caucasus, in all the European nations bordering the Mediterranean Sea, in Bulgaria, Austria and Switzerland, and also on the island of Gotland (Sweden).

Habitat

Open woodland, pine-woods, mountain meadows, dwarf mountain scrub, between 1000 and 2000 m, on calcareous soil covered with snow during winter.

Status and conservation

An undoubtedly rare species in Italy, found in a relatively small number of locations distributed over the central and eastern Alps and the Apennines.

Latium (FR), Monti Simbruini, M. Viperella, m 1800.

x 2

x 2

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a

b

Orchis tridentata Scopoli

Systematics

The systematic position of *Orchis commutata* Todaro is still controversial; in fact, it is practically indistinguishable from a morphological point of view from *O. tridentata*, from which it differs in the larger size of both plant and flowers on the average. However, their chromosome numbers, are different: *O. commutata* has 2n=84, which is double that of *O. tridentata*.

Description

Plant 15-40 cm tall. Leaves green with a bluish shade, the lower ones broadly lanceolate, the others narrower, acute, sheathing the stem. Inflorescence dense, hemispherical to ovoid. Bracts membranaceous, about as long as, or slightly shorter than the ovary, lanceolate and acuminate. Sepals pinkish veined with purple, lanceolate, acute, converging to form an elongate hood, their apices sometimes curving outwards. Petals narrowly lanceolate, acute, slightly shorter and much narrower than sepals, hidden by the hood. Lip about as long as the sepals, very variable in shape but always trilobed, with side lobes more or less curving forwards, linear or subspatulate, with truncate or toothed apex, and mid-lobe much larger, its margins usually irregular, and its apex entire to more or less bilobed; the colour of the lip varies from almost white to pale violet, speckled all over in a darker shade than the ground colour; spur whitish or pinkish, about as long as the ovary or slightly shorter, cylindrical, slightly curved, pointing downwards.

Flowering period

From the beginning of April to mid June.

Geographical distribution

Central and southern Europe, and the Near East, from southern France to the Caucasus; absent from the Iberian Peninsula.

Habitat

Poor grassland, mountain pasture, garrigue, scrub, glades, up to 1600 m, on dry to relatively damp, calcareous soil.

Status and conservation

Present in all the Italian regions; in Sicily it is represented by the form with double chromosome number (= *O. commutata*) (Mazzola, 1984).

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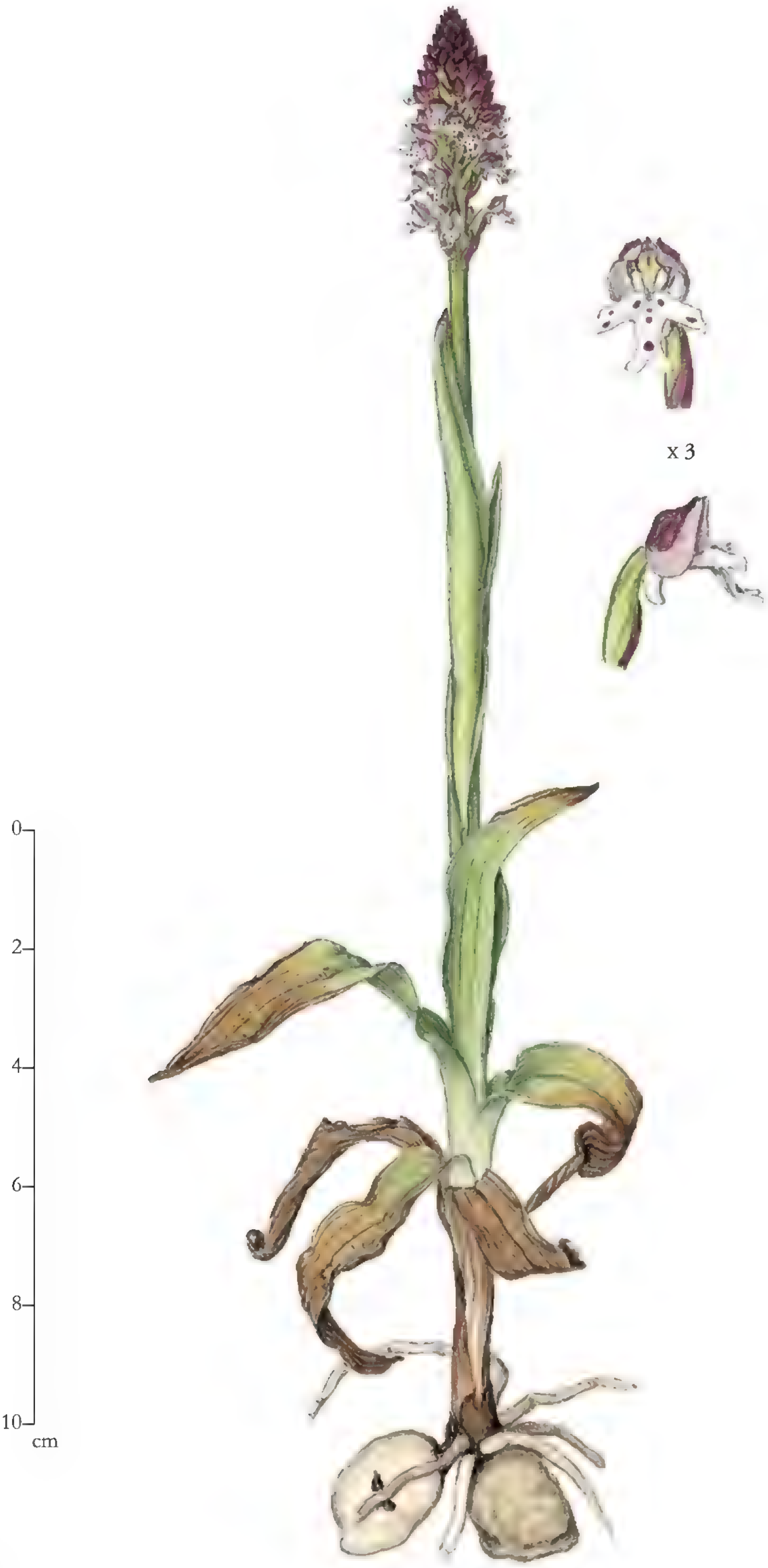
a. Tuscany (GR), M. Calvo di Ravi, m 400; b. Sicily (ME), M. Nebrodi, C. di Campieri.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Orchis ustulata Linnaeus

Description

Plant usually small, 10-35 cm tall. Leaves greyish-green, oblong to lanceolate, the lower spreading and forming a rosette, the others sheathing the stem for most of its length. Inflorescence at first ovoid, then cylindrical, usually dense, but becoming more open below, composed of many small, scented flowers. Bracts pinkish to purplish, broadly lanceolate, acute, about half as long as the ovary or slightly more. Sepals blackish-brown when flowers are in bud, but paler after they open, brownish-purple tinged with green, ovate, obtuse, converging to form a hemispherical hood. Petals slightly shorter and much narrower than sepals, linear or spathulate, pinkish to violet, concealed by the hood. Lip longer than sepals, white with few purplish spots, concave near the base, deeply trilobed, with side lobes divergent, oblong or spathulate, obtuse or toothed at the apex, and mid-lobe distinctly longer, strap-like, divided near the apex into two slightly diverging lobules, sometimes separated by a small tooth; spur whitish, very short (2-3 mm), conical, curving downwards.

Flowering period

From mid April to mid July.

Geographical distribution

Eurosiberian, less common in southern Europe.

Habitat

Poor grassland, mountain meadows, scrubland, from 150 to 2000 m, on alkaline to acidic, dry to fairly damp soil.

Status and conservation

Present in all the Italian regions with the exception of the islands.

Tuscany (GR), M. Labro, m 1000.

PLATANTHERA L.C.M. Richard

The Italian species of the genus *Platanthera* are characterized by the presence of only two elongate leaves (rarely three) at the base of the stem, radish-like tubers, angled stem, strap-like lip, narrow and elongate spur, distinct viscidia, bursicle absent.

The chromosome number is 2n=42.

The flowers are perfectly suited to pollination by moths: very pale colour, strong perfume, very long and narrow spur with nectar reachable only by the long proboscis of moths. Hybrids between the two Italian species are not frequent. The closely parallel pollinia of *Platanthera bifolia* usually stick to the base of the proboscis, while the divergent ones of *P. chlorantha* stick more frequently to the sides of the moth's head. This makes cross pollination very difficult between the two orchids even when they are visited by the same moth.

Key to the genus Platanthera

1	Pollinia parallel	***P. bifolia,***
1*	Pollinia diverging at the base	**2**
2	Inflorescence lax; spur usually exceeding 22 mm	***P. chlorantha*** subsp. ***chlorantha***
2*	Inflorescence compact; spur not exceeding 22 mm	***P. chlorantha*** ssubsp. ***algeriensis***

x 2

0
2
4
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8
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cm

Platanthera bifolia (Linnaeus) L.C.M. Richard

Description

Usually slender plant 20-60 cm tall. Stem angled, bearing near the base two large leaves which are sub-opposite, elliptic to narrowly ovate, with a blunt apex and a narrow base; sometimes a third smaller leaf is found just above the other two; the upper leaves are much smaller, narrow and pointed. Inflorescence cylindrical, usually lax. Bracts lanceolate, about as long as the ovary. Sepals whitish, the laterals spreading, lanceolate, obtuse, the dorsal much broader, rounded at the apex, almost erect. Petals whitish or tinged with pale green, narrowly lanceolate, obtuse, about as long as the dorsal sepal and forming with the latter, a loose hood. Lip strap shaped, rounded at the apex, slightly longer than lateral sepals, whitish to greenish, always paler at the base; spur slender, pale green, up to twice as long as the ovary. Pollinia parallel and close together.

Flowering period

April to June (up to mid July to the North).

Geographical distribution

Palaeotemperate; it is present in most of Europe, reaching North Africa to the South (Tunisia and Algeria) and Siberia to the East.

Habitat

Open woodland, scrub, glades, meadows, on wet to dry soil, up to 2400 m, on various substrates.

Status and conservation

Found in all Italian regions except Sardinia and Sicily; less common in the South.

Tuscany (PO), Figline, chestnut-wood near Cerreto.

x 2

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8
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cm

Platanthera chlorantha (Custer) Reichenbach subsp. **chlorantha**

Systematics

Synonyms: *Platanthera bifolia* (Linnaeus) L.C.M. Richard subsp. *chlorantha* (Custer) Rouy. ? *P. montana* (F.W. Schmidt) Reikenbach Fil. (if the latter synonymy is confirmed, the name *montana* has priority)

Description

Similar to *P. bifolia*, although somewhat more robust. The two species can be safely distinguished only by flower morphology. In *P. chlorantha* the pollinia are widely spaced and diverging at the base; furthermore, the flowers are usually larger, whitish, pale green, or yellowish-green, with a broader dorsal sepal, usually twisted lateral sepals, and spur inflated at the tip.

Flowering period

April to June (up to mid July in the North).

Geographical distribution

Eurosiberian; absent from Portugal, extending to Lebanon and Syria to the south-east.

Habitat

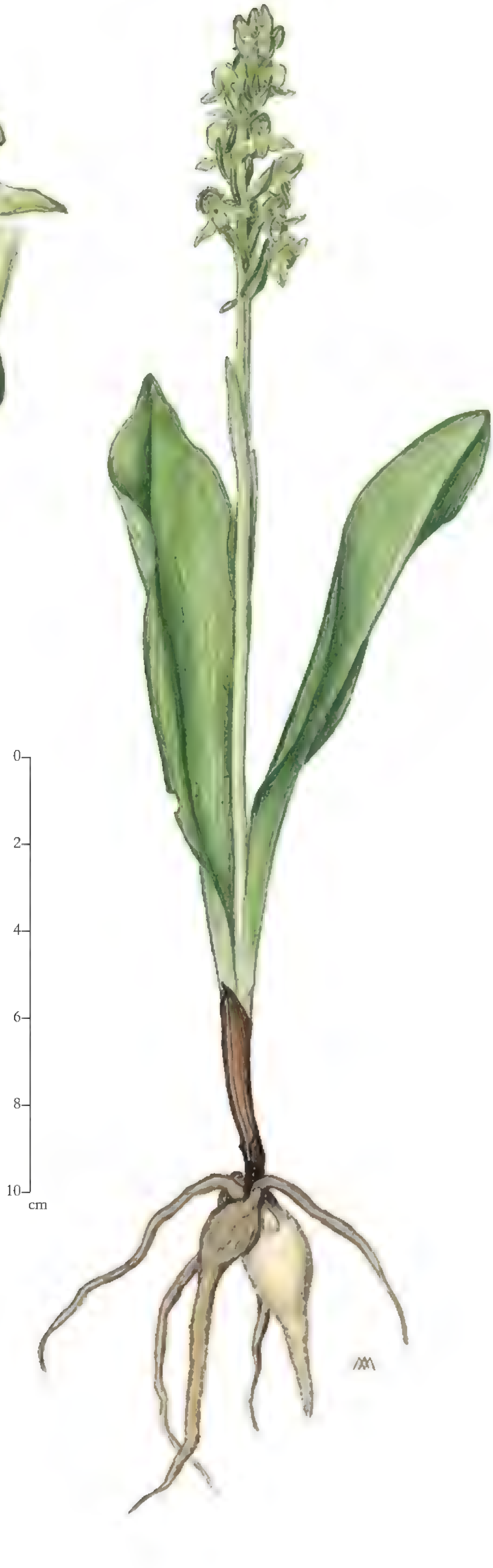
Open woodland, scrub, glades, meadows, on wet to dry soil, up to 2000 m, on various substrates.

Status and conservation

Found in all Italian regions except Sardinia; less common in the South.

Tuscany (FI), near Vallombrosa, m 1100.

x 2



Platanthera chlorantha (Custer) Reichenbach subsp. **algeriensis** (Battandier et Trabut) Emberger

Systematics

Synonyms: *Platanthera algeriensis* Battandier et Trabut.

Description

Differs from the subsp. *chlorantha* in having a more compact inflorescence, usually darker flowers, a more curved lip, and a shorter spur.

Flowering period

From the end of May to the end of July.

Geographical distribution

West-Mediterranean: Algeria, Morocco, southern Spain, Corsica and Sardinia.

Habitat

Wet meadows surrounding springs and streams, between 600 and 1600 m.

Status and conservation

Quite rare in Sardinia, where it is found especially in the central region (Scrugli & Cogoni, 1990).

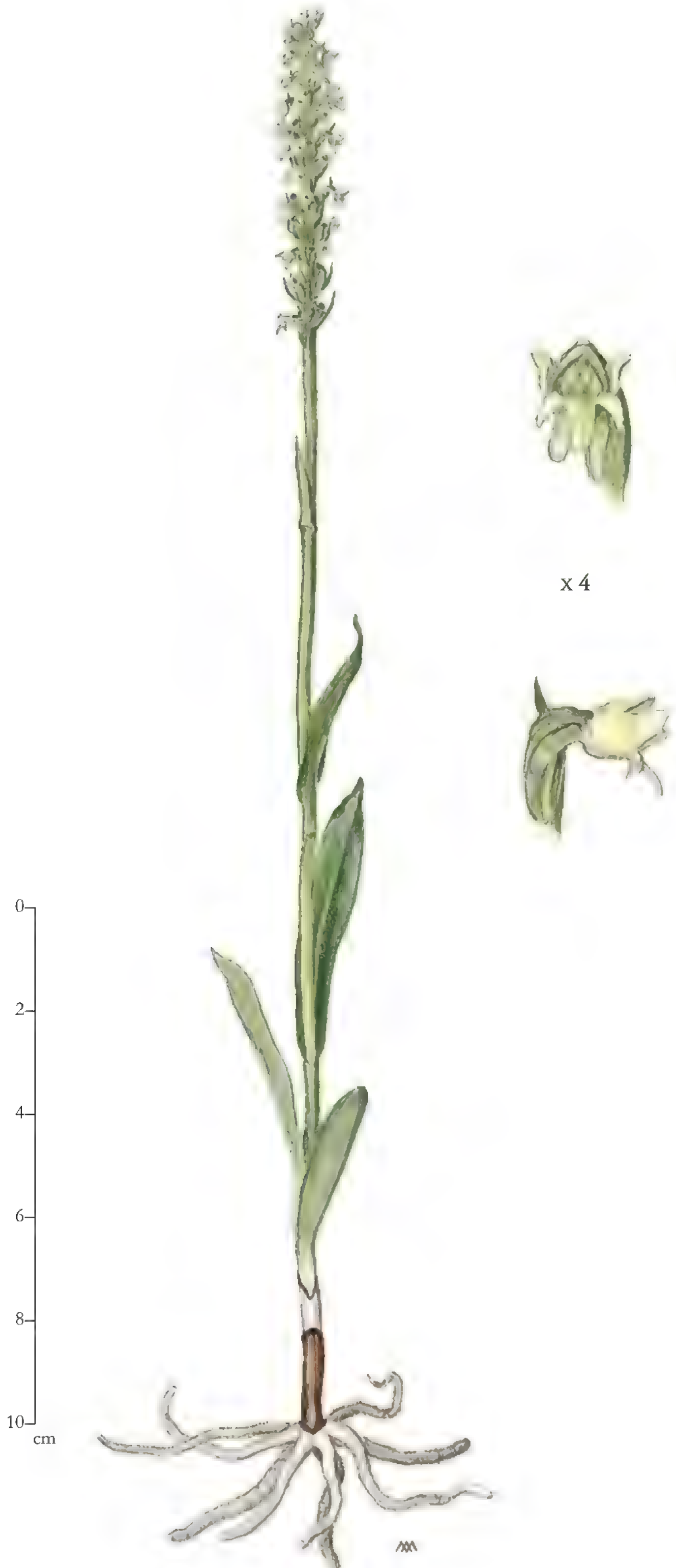
Sardinia (NU), Massif Gennargentu, Bruncu Spina, m 1350.

PSEUDORCHIS Séguier

A monospecific genus characterized by elongate, subcylindrical tubers divided up to the base; the flowers have a short spur and distinct viscidia lacking a bursicle.

The chromosome number is 2n=42.

Various authors agree that butterflies and moths are the pollinators of *Pseudorchis albida*; in fact, only the slender proboscis of these insects is able to reach the nectar through the narrow opening of the spur of these flowers. The high percentage of capsule production leads one to think that self-pollination also occurs.


x 4
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cm

Pseudorchis albida (Linnaeus) A. et D. Löve

Habitat

Mountain pastures, edges and glades of woods, from 600 to 2500 m, on both acidic and alkaline soil.

Status and conservation

Quite common in the Alps, much less so in the northern and central Apennines.

Description

Slender plant 15-35 cm tall. Lower leaves oblanceolate, sheathing the stem; upper leaves narrower, lanceolate, non-sheathing. Inflorescence elongate, cylindrical, quite dense, composed of very many tiny flowers coloured creamy yellow or greenish-white. Bracts lanceolate, slightly longer than the ovary. Sepals elliptical, curved forwards to form a hood with the slightly smaller petals. Lip deeply trilobed, with the mid-lobe slightly longer than the side lobes; spur curved downwards, slightly thickened at the apex, almost half as long as the ovary.

Flowering period

From the end of May to the beginning of August.

Geographical distribution

Arctic-Alpine, from Greenland to the Kamtchatka peninsula.

Friuli (UD), Sella Nevea, between M. Bila Pec and M. Poviz, m 1750.

SERAPIAS Linnaeus

The genus *Serapias* is quite uniform from a morphological point of view; it is characterized by a lip without a spur and divided in two portions by a marked constriction, sepals and basal portion of the lip (hypochile) forming a tubular structure, petals clearly narrower than and usually concealed by sepals, narrow, linear-lanceolate leaves. As to the reproductive structures, pollinia and caudicles are distinct with a single bursicle and viscidium; the column ends in an elongate tip.

The range of the genus is mainly Mediterranean, bounded by the Azores to the west, the Caucasus and the Near East to the east, northern Africa to the south, and central France to the north.

All the species have the chromosome number 2n=36, with the sole exception of *Serapias lingua* which is tetraploid (2n=4x=72).

With few exceptions *Serapias* species all lack nectar and are pollinated by solitary Hymenopterans (those not forming colonies), which use as a shelter the small tube formed by the sepals and the hypochile; cross pollination is ensured by the behaviour of these insects, which visit several flowers before choosing the one in which to spend the night or to use as a shelter against rain, wind or cold. One of the exceptions is *S. parviflora*, whose flowers are self-pollinated before opening. The pollination mechanism in *Serapias lingua* is completely different, using fragrant substances which attract the males of a small bee (*Ceratina cucurbitina*); it seems that the large hump at the base of the lip, a unique characteristic amongst the *Serapias* species (see key to the genus) also plays a role in attracting these insects.

Key to the genus Serapias

1	Lip with a single large hump at the base	***S. lingua***
1*	Lip with two linear humps at the base	**2**
2	Epichile with a narrow paler margin	***S. nurrica***
2*	Epichile uniform in colour	**3**
3	Epichile less than 14 mm long; petals less than 4 mm wide	**4**
3*	Epichile more than 14 mm long; petals more than 4 mm wide	**5**
4	Epichile dark brownish-red; pollinia entire and ovaries not enlarged at blooming	***S. politisii***
4*	Epichile paler; pollinia disintegrated and ovaries already enlarged at blooming	***S. parviflora***
5	Epichile less than 2/3 as broad as long	***S. vomeracea***
5*	Epichile at least 2/3 as broad as long	**6**
6	Hypochile clearly emerging from the hood; leaves unspotted	***S. neglecta***
6*	Hypochile slightly emerging from the hood; leaves spotted at the base	***S. cordigera***
6	Ipochilo chiaramente sporgente dal casco; foglie non macchiate	***S. neglecta***

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Serapias cordigera Linnaeus

Systematics

Serapias cossyrensis B. et H. Baumann, recently described (1999) as endemic to Pantelleria island, differs from *S. cordigera* in the smaller size of the plant and the slightly larger size of the flowers.

Description

Plant 15-45 cm tall. Leaves linear to narrowly lanceolate, acute, keeled, channelled, erect or arched, often spotted with purple near the base, the upper ones gradually smaller and sheathing the stem. Inflorescence usually compact, composed of 3-8 large flowers, rarely more. Bracts broadly lanceolate, the lower ones exceeding the hood, greyish to purplish, veined longitudinally with deep red. Sepals broadly lanceolate, acute, forming an elongate hood of the same colour as the bracts. Petals slightly shorter than the sepals and completely hidden by the hood, coloured a deep brownish-red, with a very acute apex, enlarged base, and wavy margins. Lip trilobed, quite large, brownish red to deep purple, with two linear, very dark, shiny humps at the base, which diverge forwards; side lobes emerging very slightly from the hood, with darker, rounded margins curved upwards until they touch; mid-lobe hanging or slightly bent backwards, heart-shaped, with wavy margins, hairy base and centre, and fine darker veins.

Flowering period

From April to June.

Geographical distribution

Mainly Mediterranean, also present on the French Atlantic coast and in the Azores.

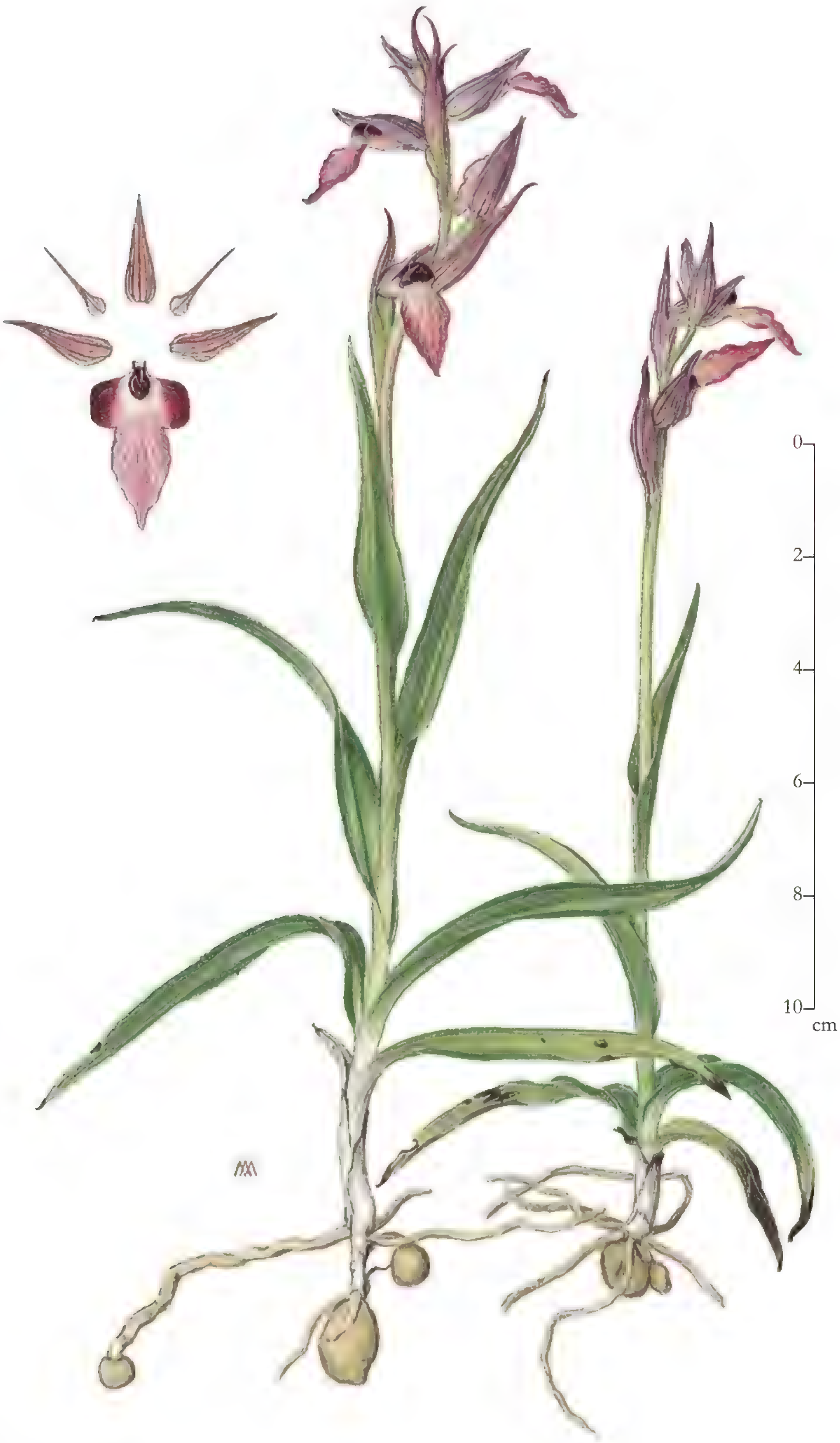
Habitat

Dry to moderately wet grassland, scrub, and garrigue, up to 1100 m, on calcareous soil.

Status and conservation

Recorded in all the regions of southern and central Italy, in Liguria, and in Emilia Romagna; a single locality is also reported in Piedmont.

Tuscany, Isola d'Elba, M. Perone, m 350.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Serapias lingua Linnaeus

Description

Plant 10-35 cm tall. Leaves linear to narrowly lanceolate, acute, keeled, arched, sometimes spotted with purple near the base, the upper ones gradually smaller and sheathing the stem. Inflorescence rather lax at maturity, composed of 2-6 flowers. Bracts broadly lanceolate, the lower ones reaching the tip of the hood, pale green, pinkish or greyish, with distinct longitudinal veining. Sepals broadly lanceolate, acute, forming an elongate hood of the same colour as the bracts. Petals slightly shorter than the sepals and completely hidden by the hood, very narrow, acute, enlarged at the base. Lip trilobed, about twice as long as the sepals, with a single, large, dark, shining, elongate, hump at the base; side lobes almost completely concealed inside the hood, with dark, truncate margins curved upwards; mid-lobe usually pendent, tongue-shaped, broadly lanceolate, pubescent at its base, very variable in colour, from almost white to purplish-red with darker veins.

Flowering period

From mid March to mid June.

Geographical distribution

Mediterranean, from Portugal to the island of Rhodes.

Habitat

Moderately damp grassland, garrigue, scrub, and open woodland, up to 1500 m, on various substrates.

Status and conservation

Reported from all the Italian regions except the northernmost: Trentino Alto Adige, Veneto, Lombardy, and Valle d'Aosta; its presence in southern Piedmont is doubtful (Cavallo et al., 1993).

Tuscany (GR), Montepescali, Poggio Romano.

Serapias neglecta De Notaris

Description

Sturdy plant, 10-30 cm tall. Leaves linear to narrowly lanceolate, keeled, channelled, recurved, the upper ones gradually smaller and sheathing the stem. Inflorescence usually compact and few flowered, but sometimes cylindrical with up to 12 flowers, rarely more. Bracts broadly lanceolate, not reaching the tip of the hood, pale green tinged pink to purplish, with darker longitudinal veins. Sepals of the same colour as the bracts, lanceolate, acute, forming an elongate hood. Petals linear, with orbicular base, slightly shorter than the sepals and completely hidden by the hood. Lip trilobed, quite large, at least twice as long as the sepals, with two linear, almost parallel, dark humps at the base; side lobes curved upwards, clearly protruding from the hood; mid-lobe usually hanging, heart-shaped to broadly lanceolate, with wavy margins and hairy base and centre. The colour of the lip is very variable, ranging from pale cream and salmon pink to deep red, the median lobe usually veined in darker shades of these same colours, and the side lobes darker at the margins.

Flowering period

From the end of March to mid May.

Distribution

Central-Mediterranean, from Provence (southern France) to Corsica and Tuscany.

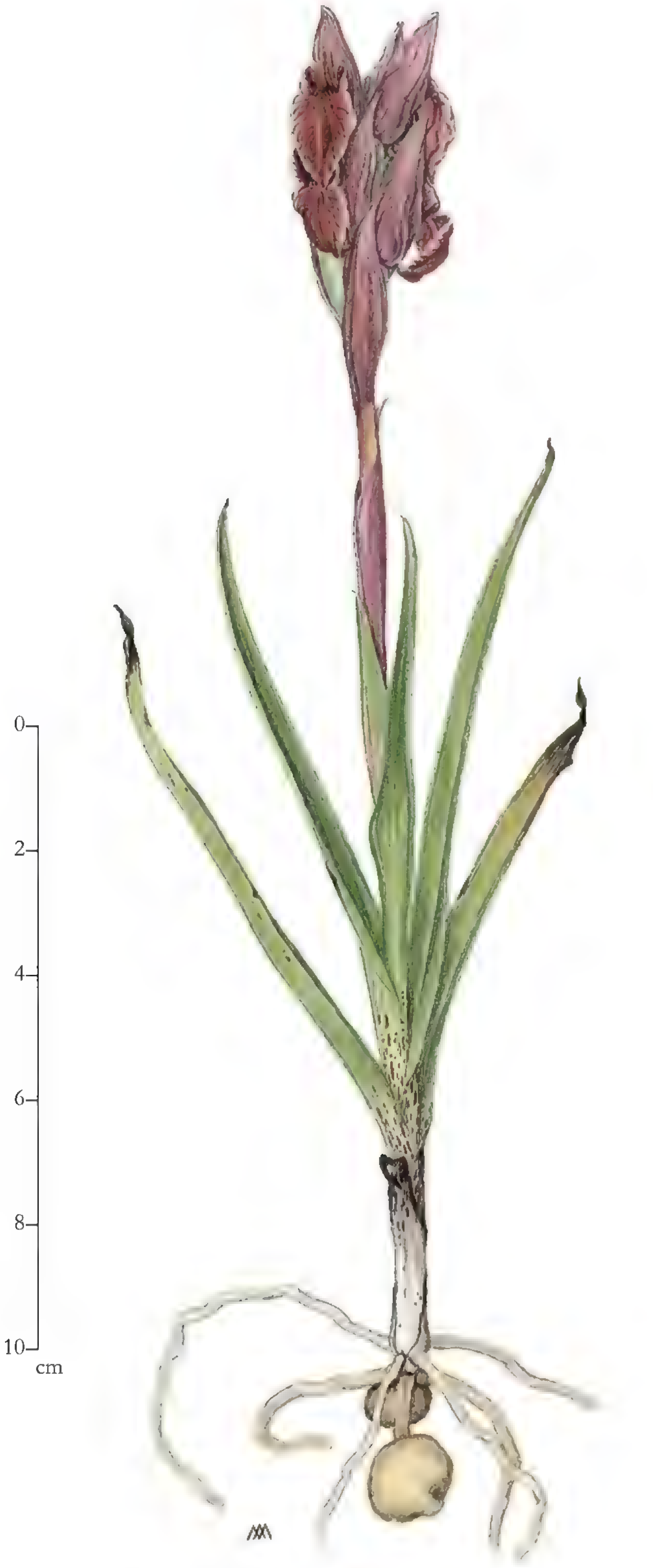
Habitat

Dry to moderately damp grassland, garrigue, open pine woods, up to 600 m, on alkaline to slightly acidic soil.

Status and conservation

In Italy it is found in Liguria, Emilia Romagna, and Tuscany (including the island of Elba).

Tuscany, Isola d'Elba, near Scaglieri.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Serapias nurrica Corrias

Description

Plant 20-35 cm tall. Stem and base of the leaves spotted deep red. Leaves broadly arranged into two rows, usually quite long, narrowly lanceolate, acute, keeled, grooved, the upper ones gradually smaller and sheathing the stem. Inflorescence short and compact, composed of 5-8 flowers. Bracts broadly lanceolate, not reaching the tip of the hood, pinkish-grey and veined longitudinally with deep red outside, darker inside. Sepals broadly lanceolate, acute, forming an elongate, almost erect hood of the same colour as the bracts. Petals slightly shorter than the sepals and completely hidden by the hood, with a blackish-purple, rounded base, and a very narrow upper half. Lip trilobed, slightly longer than sepals, brownish-red with a narrow, greyish, wavy margin, and two linear, very dark, shiny humps at the base, which diverge forwards; side lobes truncate, almost completely enclosed in the hood; mid-lobe broadly lanceolate, hairy at the base and in the centre, usually pendant, but sometimes almost horizontal.

Flowering period

From mid April to the beginning of June.

Geographical distribution

Sardinia, Corsica, southern France, Balearic Islands, eastern Sicily, southernmost tip of Calabria.

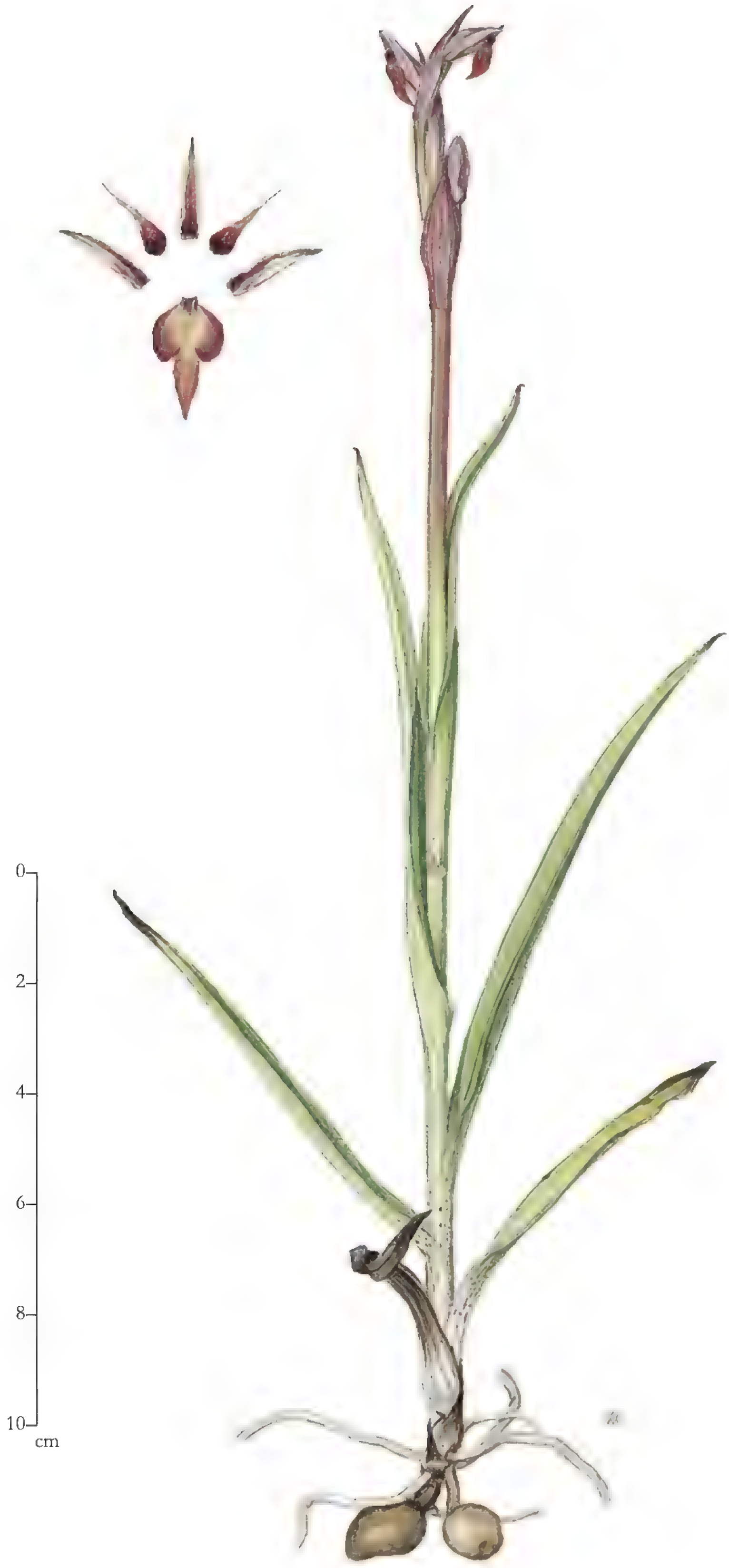
Habitat

Scrub and garrigue, from sea level to 250 m in Sardinia, but up to 1000 m in Sicily, on dry soil.

Status and conservation

This species seems quite rare and local, but might still be insufficiently known because of its relatively recent description (Corrias, 1982).

Sardinia (SS), Stintino.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Serapias parviflora Parlatore

Description

Slender plant 10-30 cm tall. Leaves often arranged in two rows, sub-erect, linear-lanceolate, keeled, acute, pale green, sometimes dotted with red near the base. Inflorescence narrow, composed of 3-8 relatively small flowers at first close to each other, but more widely spaced at maturity. Bracts as long as, or slightly longer than flowers, broadly lanceolate, acuminate, pale green to purplish-pink, with darker longitudinal veins. Sepals of the same colour as the bracts or slightly paler, lanceolate, acute, forming an elongate hood. Petals slightly shorter than the sepals and completely hidden by the hood, linear, acuminate, enlarged and much darker at the base. Lip small, trilobed, slightly longer than sepals, with two linear, almost parallel, dark humps at the base and whitish, short hairs in the centre; side lobes concealed by the hood, with dark, rounded margins curved upwards; mid-lobe narrow, lanceolate, acute, folded back to lie along the ovary, yellowish to brick-red.

Flowering period

From the beginning of April to mid June.

Geographical distribution

Mediterranean-Atlantic, from the Canary Islands to Cyprus.

Habitat

Poor grassland, scrub, and garrigue, up to 1200 m, on dry to relatively damp, alkaline to slightly acidic, or even sandy soil.

Status and conservation

Present in all the regions of southern Italy, in central Italy except Umbria, in Liguria, and on the islands.

Sardinia (SS), Stintino, Punta Negra.

Serapias politisii Parlatore

Systematics

The various authors disagree about the systematic value of this orchid and about its name. Some claim that it is identical with *Serapias bergonii* E.G. Camus, an epithet which in this case would have priority. It is worthy of note that both *S. politisii* and *S. bergonii* were originally described as hybrids.

Description

Very similar to *Serapias parviflora*, from which it differs in having a more elongated inflorescence, a longer lip, and darker flower colour. Moreover, the ovaries are not already enlarged when the flowers open, as in *S. parviflora*.

Flowering period

From the beginning of April to mid May.

Geographical distribution

Ionian islands, the western coast of Greece, and southern Italy.

Habitat

Garrigue and scrub, from sea level to 500 m, on dry, calcareous or sandy soil.

Status and conservation

Because of the uncertainty of the taxonomic position of this orchid, and the Italian populations in particular, it is not possible to describe accurately its distribution in Italy. However, it can be stated that it has been reported so far only from a few locations in the Salento, in southern Apulia, and in Sicily.

Apulia (LE), Salento, near il Bosco di Rauccio.

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cm

Serapias vomeracea (N.L. Burman) Briquet

Systematics

Synomyms: *Serapias longipetala* (Tenore) Pollini.

Description

Plant 15-60 cm tall. Lower leaves narrowly lanceolate, acute, keeled, sub-erect or curving outwards, the upper ones gradually smaller and sheathing the stem. Inflorescence elongate, composed of 3-12 flowers widely spaced at maturity. Bracts broadly lanceolate, concave, longer than the flowers, pale to dark pinkish-grey, more rarely greenish-grey, veined longitudinally in deep red. Sepals lanceolate, forming an elongate, pointed, almost erect hood of the same colour as the bracts outside, deep red inside. Petals almost as long as the sepals and completely hidden by the hood, very narrow and acute, with a blackish-purple, orbicular base. Lip trilobed, much longer than sepals, from pale pinkish-brown to deep purple, with two linear, parallel, dark or pale, shiny ridges at the base; side lobes with truncate margins, very dark, curving upwards until they touch, emerging only slightly from the hood; mid-lobe lanceolate, quite long, with hairy centre and base, pendant or folded backwards.

Flowering period

From April to June.

Geographical distribution

Since the various authors disagree about the taxonomic value of certain subspecies and related species, it is practically impossible to define the range of *S. vomeracea*, especially its eastern boundaries. In any case, it is predominantly a Mediterranean orchid which, however, is represented in the Middle East and the Caucasus by various subspecies and related species.

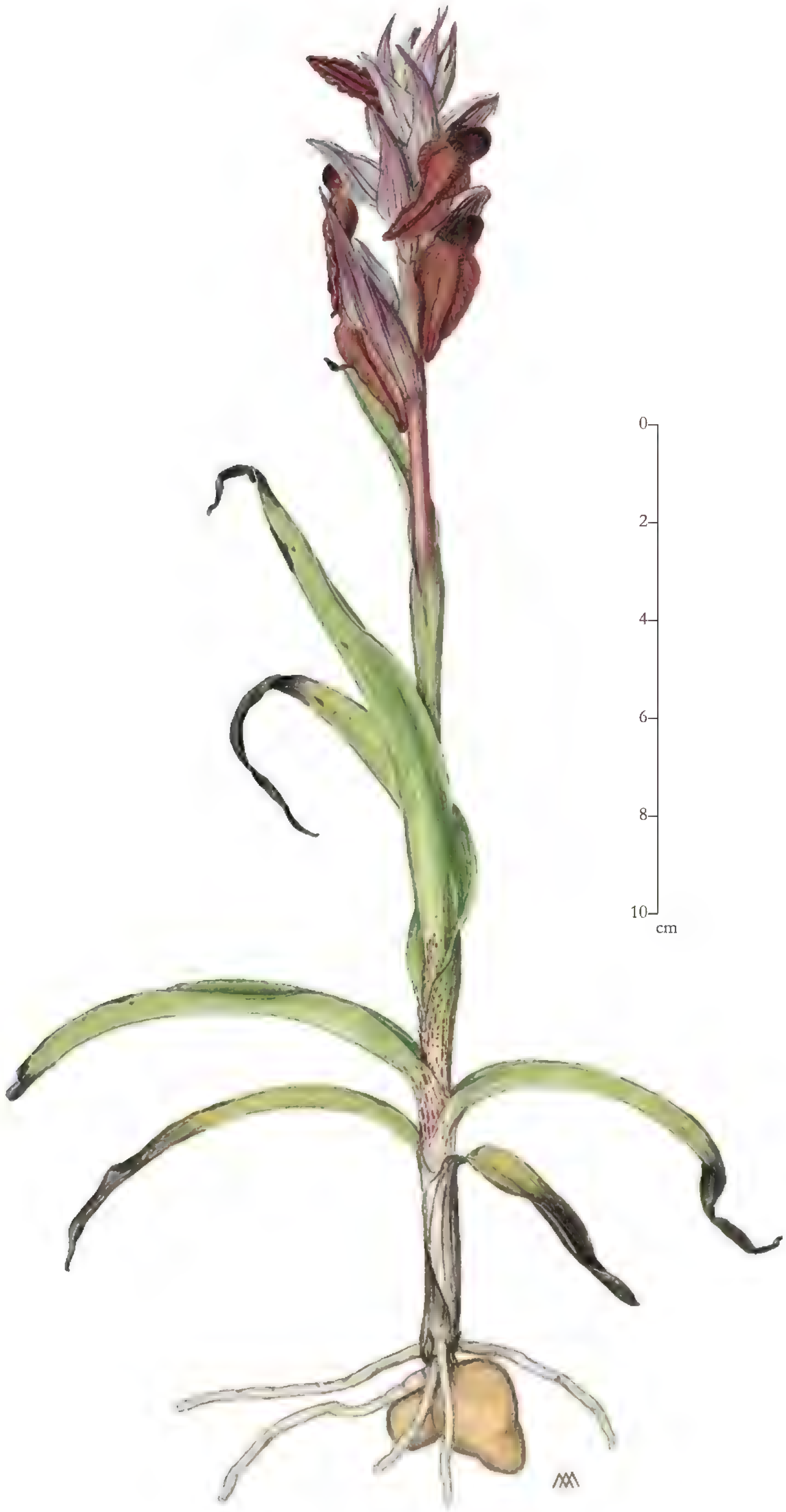
Habitat

Poor grassland, garrigue, scrub, open pine-woods, up to 1450 m, on alkaline to slightly acidic, dry to relatively damp soil.

Status and conservation

It is reported from all the Italian regions except Sardinia and Val d'Aosta; also absent from the Alto Adige.

Tuscany (GR), Between Follonica and Castiglione della Pescaia.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Serapias vomeracea (N.L. Burman) Briquet subsp. **orientalis** Greuter

Systematics

Synonyms: *Serapias orientalis* E. Nelson (nom. illeg.); *S. orientalis* (Greuter) H. Baumann et Künkele; *S. orientalis* E. Nelson subsp. *apulica* E. Nelson (nom. illeg.); *S. apulica* (H. Baumann et Künkele) P. Delforge; S. *orientalis* (Greuter) H. Baumann et Künkele subsp. *siciliensis* Bartolo et Pulvirenti.

I do not believe that the separation of *S. orientalis* and *S. vomeracea* at specific level is justified. Nelson himself (1968), who first described this orchid, reported the presence of intermediate forms. The Italian populations described below are considered here as varieties, above all because of their great variability.

Description

Differing from *Serapias vomeracea* subsp. *vomeracea* in its more sturdy habit, shorter height on the average (15-25 cm), more dense inflorescence composed of a lower number of flowers (from 2 to 7), wider bracts, mid-lobe of the lip wider and usually darker.

Flowering period

From mid March to the end of April.

Geographical distribution

Eastern-Mediterranean, from southern Italy to Turkey.

Habitat

Poor grassland, garrigue, open woodland, up to 500 m above sea level, on calcareous or sandy, dry to moderately damp soil.

Status and conservation

In Italy it is recorded only in Apulia (from the Gargano down to Salento) and from southern Sicily.

Apulia (LE), Salento, Marina di Novaglie.

SPIRANTHES L.C.M. Richard

The most obvious characteristic of the species of this genus is the spiral arrangement of its small flowers. This is caused by a twisting of the upper portion of the stem. Other characteristics are: sepals and petals similar to each other forming, together with the lip, a tubular structure, bifid rostellum; the underground portion consists of 2-6 fusiform or cylindrical tuberous roots.

The chromosome number is 2n=30.

Although the flowers are very small, they are pollinated by large Hymenopterans, usually bumblebees, which use their long proboscis to reach the nectar produced at the base of the lip.

Key to the genus Spiranthes

1 Leaves ovate to elliptic, forming a rosette next to the flowering stem ..... ***S. spiralis***

1* Leaves narrowly lanceolate, at the base of flowering stem. ..... ***S. aestivalis***

x 3

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cm

Spiranthes aestivalis (Poiret) L.C.M. Richard

Description

Slender plant up to 30 cm tall. Lower leaves narrowly lanceolate, acute, bright green, erect, the upper ones much smaller and bract-like. Inflorescence elongate, composed of small flowers forming a relatively lax spiral row. Bracts lanceolate, longer than the ovary. Sepals lanceolate, obtuse, whitish or tinged with yellow, pubescent outside. Petals slightly broader and shorter than sepals, rounded at the apex, hidden inside the narrow tube formed by sepals and lip. Lip whitish with a yellowish base, slightly longer than sepals, oblong, grooved, with a rounded, crinkled, and downwards curved tip.

Flowering period

June and July.

Geographical distribution

Mediterranean-Atlantic; from The Netherlands to the north, it reaches the former Yugoslavia to the east, and North Africa (Morocco and Algeria) to the south; not recorded for several years and probably extinct in England and Belgium; uncommon everywhere.

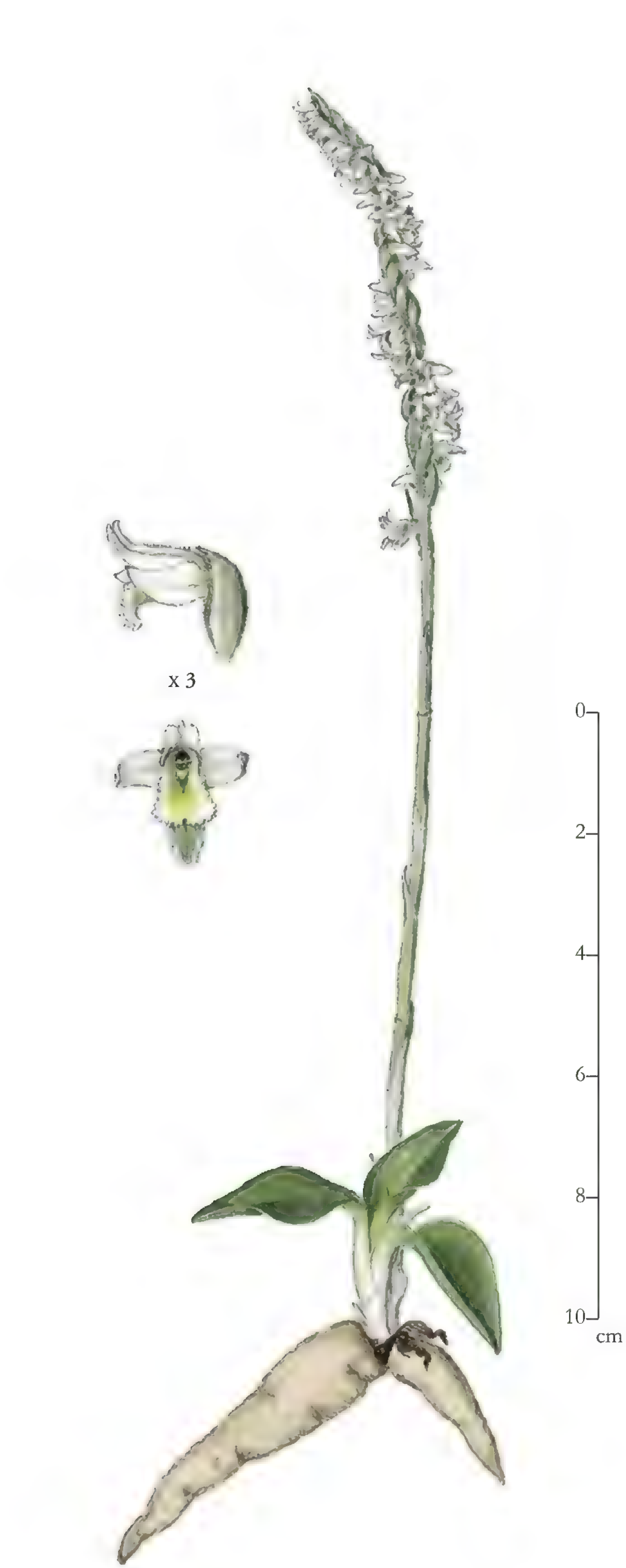
Habitat

Damp grassland, edges of streams, swamps and lakes, up to 1300 m, on acidic to neutral soil.

Status and conservation

A very uncommon species in Italy, recorded sporadically in all the regions of the north except for the Val d'Aosta, and also in Tuscany, Marche and Latium. However, there are no recent records for Trentino, Liguria, Emilia Romagna and Marche. It was certainly more common but, as throughout Europe, numbers are declining as marshy land is reclaimed.

Friuli (UD), between Fagagna and Farla.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Spiranthes spiralis (Linnaeus) Chevallier

Description

Flowering stem very slender, 10-25(30) cm tall, greyish-green, pubescent in the upper portion, bearing sheathing, acuminate scale leaves with membranaceous margins in the lower portion. Inflorescence elongate, composed of many small flowers arranged in a spiral row. Bracts acuminate, slightly longer than ovary. Sepals white with a greenish tinge near the base, lanceolate, obtuse at the apex, the laterals spreading horizontally, the dorsal directed forwards, forming with the lip and the petals a small, flared "tube". Petals similar to, but slightly smaller than sepals. Lip yellowish green, oblong, widened and rounded at the apex, with outwards curved, whitish, crinkled margins. Leaves dark green, ovate to elliptic, acute, forming a flattened rosette which emerges after the flowering stem at its side. This rosette lasts through the winter and the spring, but has withered by the time the flowering stem appears.

Flowering period

From the beginning of September (in the north) to the beginning of November (in the south.

Geographical distribution

European-Caucasian; also present in northern Africa (Tunisia and Algeria).

Habitat

Dry to moderately damp meadows, coniferous woodland, garrigue, up to 1000 m, on slightly acid to alkaline soil.

Status and conservation

It is present in all Italian regions.

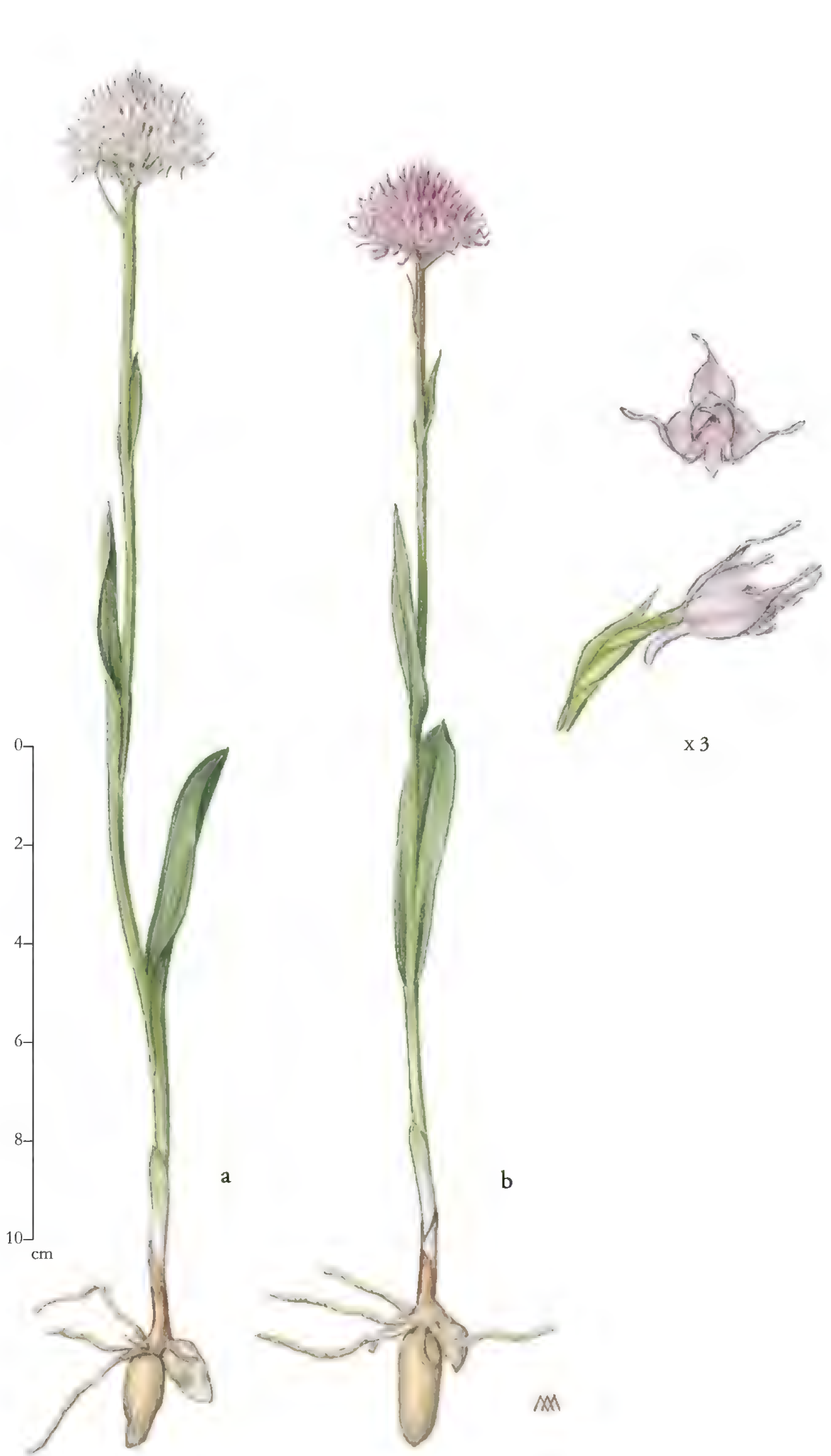
Tuscany, Isola d'Elba, pine-wood of M. Orello, m 300.

TRAUNSTEINERA Reichenbach

Flowers having a spur, a clearly trilobed rostellum, and distinct viscidia only partially covered by a bilobed bursicle; tubers entire and ovoid.

The chromosome number is 2n=42.

It has been hypothesized by various authors that *Traunsteinera globosa*, the only species of this genus present in Italy and Europe, is visited by a variety of insects which mistake its inflorescence for that of other plants growing in the alpine pastures, such as *Scabiosa columbaria* (Dipsacaceae) and *Valeriana montana* (Valerianaceae).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b

Traunsteinera globosa (Linnaeus) Reichenbach

Geographical distribution

South-European, from the Pyrenees to the Balkans; in Turkey and the Caucasian region is *Traunsteinera sphaerica* (von Bieberstein) Schlechter, considered by some as a subspecies of *T. globosa*.

Habitat

Alpine and subalpine meadows, from 900 to 2300 m, on dry to damp, calcareous soil.

Status and conservation

Found along all of the Alpine chain south to the northern Apennines; records from central Apennines need confirmation.

Description

Plant 20-50(60) cm tall, with a relatively slender and elongate stem. Leaves green with a bluish tinge, clasping, oblong-lanceolate, erect, widely spaced, progressively and considerably smaller higher up. Inflorescence very dense, at first conical, then hemispherical to subglobose, composed of numerous small, pinkish flowers. Bracts very acute, tinged pink at their margins, about as long as the ovaries. Sepals pointing forwards, narrowly ovate, their tips ending in an elongate and spathulate apex. Petals very similar to the sepals but with a short and acute apex. Lip spotted purple, deeply trilobed, with mid-lobe longer than the side lobes, triangular and sometimes toothed at the apex; spur very slender, less than half as long as the ovary, curved downwards.

Flowering period

From the end of May to the beginning of August.

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a. Lombardy (BS), meadows above Bazena, m 2000; b. Lombardy (BG), Valle di Scalve, meadows above Cimalbosco, m 1800.

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INDEX TO SCIENTIFIC NAMES

Aceras athropophorum, 237
Anacamptis pyramidalis, 13, 15
Anteriorchis coriophora, 243

Barlia robertiana, 19

Cephalanthera damasonium, 21, 23
Cephalanthera longifolia, 21, 25
Cephalanthera rubra, 21, 27
Chamorchis alpina, 31
Coeloglossum viride, 33, 35
Corallorhiza trifida, 39
Cypripedium calceolus, 5, 8, 41, 43

Dactylorhiza alpestris, 59
Dactylorhiza cruenta, 49
Dactylorhiza elata ssp. sesquipedalis, 47
Dactylorhiza elata, 8, 45, 47, 59
Dactylorhiza fistulosa, 59
Dactylorhiza fuchsii, 55
Dactylorhiza gervasiana, 55
Dactylorhiza incarnata, 45, 49, 59
Dactylorhiza insularis, 45, 53, 63
Dactylorhiza lapponica, 59, 61
Dactylorhiza latifolia, 59, 65
Dactylorhiza maculata ssp. meyeri, 55
Dactylorhiza maculata, 45, 55, 59
Dactylorhiza majalis, 45, 59
Dactylorhiza markusii, 63
Dactylorhiza praetermissa, 49
Dactylorhiza romana, 45, 53, 63
Dactylorhiza saccifera, 55
Dactylorhiza sambucina, 45, 53, 65
Dactylorhiza traunsteineri, 59

Epipactis atrorubens, 67, 69
Epipactis distans, 75
Epipactis flaminia, 67, 71
Epipactis gracilis, 85
Epipactis greuteri, 71
Epipactis helleborine ssp. latina, 75
Epipactis helleborine ssp. orbicularis, 75
Epipactis helleborine ssp. tremolsii, 75
Epipactis helleborine, 67, 73, 75
Epipactis leptochila ssp. neglecta, 77
Epipactis leptochila, 67, 77
Epipactis microphylla, 67, 79
Epipactis muelleri ssp cerritae, 81, 87
Epipactis muelleri, 67, 81, 87
Epipactis palustris, 67, 83
Epipactis persica ssp. gracilis, 85
Epipactis persica, 67
Epipactis placentina, 67, 87
Epipactis pollinensis, 89
Epipactis purpurata, 67, 89
Epipactis viridiflora, 89
Epipogium aphyllum, 93

Gennaria diphylla, 8, 95, 97
Goodyera repens, 99, 101
Gymnadenia conopsea, 103, 105, 107
Gymnadenia odoratissima, 103, 107

Hammarbya paludosa, 8, 109, 111
Herminium monorchis, 113, 115
Himantoglossum adriaticum, 121
Himantoglossum hircinum ssp. adriaticum, 121
Himantoglossum hircinum ssp. hircinum, 119, 121
Himantoglossum longibracteatum, 19

Leucorchis albida, 297
Limodorum abortivum, 123, 125, 127, 129
Limodorum brulloi, 123, 127
Limodorum trabutianum, 123, 127, 129
Liparis loeselii, 8, 43, 131, 133
Listera cordata, 135, 137
Listera ovata, 135, 139
Loroglossum hircinum, 119

Malaxis monophyllos, 141, 143
Malaxis paludosa, 111
Microstylis monophyllos, 143

Neotinea intacta, 147
Neotinea maculata, 145, 147
Neottia nidus-avis, 151
Nigritella buschmanniae, 153
Nigritella cenisia, 153
Nigritella corneliana, 153, 155, 157
Nigritella dolomitensis, 153
Nigritella miniata, 161
Nigritella nigra ssp. austriaca, 153
Nigritella nigra, 159
Nigritella rhellicani, 153, 155, 157, 159, 161, 163
Nigritella rubra, 153, 155, 161
Nigritella widderi, 153, 155, 163

Ophrys apifera, 165, 166, 169, 189
Ophrys apiformis, 215
Ophrys araneola, 219
Ophrys argentaria, 219
Ophrys argolica, 183

Ophrys atrata, 197
Ophrys aurelia, 175
Ophrys bertolonii, 166, 171, 173, 175, 225
Ophrys bertoloniiformis ssp. benacensis, 171, 175
Ophrys bertoloniiformis ssp. bertoloniiformis, 166, 173, 175
Ophrys biancae, 185
Ophrys biscutella, 183
Ophrys bombyliflora, 165, 166, 177
Ophrys bornmuelleri, 185
Ophrys bremifera, 215
Ophrys ciliata, 166, 179
Ophrys cornuta, 217
Ophrys crabronifera ssp. crabronifera, 166, 181, 183, 207
Ophrys crabronifera ssp. sundermannii, 183
Ophrys discors, 167, 185
Ophrys eleonorae, 195
Ophrys exaltata ssp. archipelagi, 187
Ophrys exaltata, 167, 187
Ophrys fuciflora ssp. apulica, 191
Ophrys fuciflora ssp. candica, 189
Ophrys fuciflora ssp. celiensis, 209
Ophrys fuciflora ssp. chestermanii, 191, 193
Ophrys fuciflora ssp. elatior, 229
Ophrys fuciflora ssp. fuciflora, 167, 189, 191, 215, 229
Ophrys fuciflora ssp. gracilis, 229
Ophrys fuciflora ssp. pollinensis, 183
Ophrys fusca ssp. iricolor, 195
Ophrys fusca, 166, 195
Ophrys galilaea, 205
Ophrys garganica, 219
Ophrys holoserica, 189
Ophrys incubacea, 167, 197, 225
Ophrys insectifera, 165, 166, 199
Ophrys lacaitae, 166, 201, 209
Ophrys litigiosa, 219
Ophrys lunulata, 43, 166, 203
Ophrys lutea ssp. murbekii, 205
Ophrys lutea, 166, 205
Ophrys majellensis, 219
Ophrys mirabilis, 195
Ophrys montenegrina, 221
Ophrys morisii, 167, 207
Ophrys oestrifera, 217
Ophrys oxyrrhynchos, 167, 201, 209
Ophrys pallida, 166, 211
Ophrys panormitana, 187
Ophrys passionis, 221
Ophrys promontorii, 166, 173, 213
Ophrys scolopax ssp. conradiae, 215
Ophrys scolopax ssp. cornuta, 217
Ophrys scolopax ssp. sardoa, 215
Ophrys scolopax ssp. scolopax, 166, 215
Ophrys sicula, 205
Ophrys sipontensis, 219
Ophrys speculum, 179
Ophrys sphegodes ssp. garganica, 221
Ophrys sphegodes ssp. majellensis, 221
Ophrys sphegodes ssp. praecox, 207, 223
Ophrys sphegodes ssp. sicula, 187
Ophrys sphegodes ssp. sipontensis, 221
Ophrys sphegodes ssp. sphegodes, 167, 173, 197, 219, 221, 223, 225
Ophrys splendida, 223
Ophrys tarentina, 166, 225
Ophrys tenthredinifera, 166, 227
Ophrys tetraloniae, 167, 229
Ophrys tyrrhena, 167, 207, 231
Ophrys vernixia, 179
Orchis anthropophora, 11, 233, 237
Orchis brancifortii, 233, 234, 239
Orchis caspia, 267
Orchis collina, 19, 234, 241
Orchis commutata, 283
Orchis coriophora, 233, 234, 243
Orchis fragrans, 243
Orchis ichnusae, 255
Orchis intacta, 147
Orchis italica, 234, 245
Orchis lactea, 234, 247
Orchis latifolia, 59, 65
Orchis laxiflora, 45, 249, 265
Orchis longicornu, 234, 251, 261
Orchis mascula ssp. ichnusae, 253, 255
Orchis mascula ssp. mascula, 45, 234, 253, 255, 257
Orchis mascula ssp. olbiensis, 257
Orchis militaris, 234, 259
Orchis morio ssp. picta, 261
Orchis morio, 234, 251, 261
Orchis ovalis, 253
Orchis pallens, 234, 263
Orchis palustris, 8, 45, 235, 249, 265
Orchis papilionacea, 45, 233, 234, 267
Orchis patens, 233, 235, 269
Orchis pauciflora, 234, 271
Orchis provincialis, 234, 273
Orchis pseudolaxiflora, 249
Orchis purpurea, 234, 275
Orchis quadripunctata, 233, 234, 239, 277
Orchis rubra, 267
Orchis saccata, 241
Orchis signifera, 253
Orchis simia, 234, 279
Orchis spitzelii, 8, 235, 281
Orchis tridentata, 234, 283
Orchis ustulata, 145, 234, 285

Platanthera algeriensis, 293
Platanthera bifolia, 287, 289, 291
Platanthera chlorantha ssp. algeriensis, 287, 293
Platanthera chlorantha ssp. chlorantha, 287, 291
Platanthera montana, 291
Pseudorchis albida, XXII, 295, 297

Serapias apulica, 315
Serapias bergonii, 311

Serapias cordigera, 299, 301
Serapias cossyrensis, 301
Serapias lingua, 299, 303
Serapias longipetala, 313
Serapias neglecta, 299, 305
Serapias nurrica, 299, 307
Serapias orientalis ssp. siciliensis, 315
Serapias orientalis, 315
Serapias parviflora, 299, 309
Serapias politisii, 299, 311
Serapias vomeracea ssp. orientalis, 315
Serapias vomeracea, 299, 313, 315
Spiranthes aestivalis, 8, 43, 317, 319
Spiranthes spiralis, 317, 321

Traunsteinera globosa, 323, 325
Traunsteinera sphaerica, 325